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Landbird Inventory for Mount Rainier National Park (2003-2004)
Final Report

Natural Resource Technical Report NPS/NCCN/NRTR—2009/164

ON THE COVER
Black-headed grosbeak
Photograph: courtesy of NPS files

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Natural Resource Technical Report NPS/NCCN/NRTR—2009/164

Robert L. Wilkerson and Rodney B. Siegel
The Institute for Bird Populations
P.O. Box 1346
Point Reyes Station, CA 94956-1346

[1]Jim Schaberl
National Park Service
Mount Rainier National Park
55210 238th Ave. South
Ashford, WA 98304-9751

[1]Current address:
National Park Service
Shenandoah National Park
3655 U.S. Highway 211 East
Luray, VA 22835

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Summary

In 2003 The Institute for Bird Populations (IBP) collaborated with personnel at Mount Rainier National Park to initiate a two-year, park-wide, inventory of landbirds. The broad goals of the inventory were to elucidate spatial patterns of abundance across the park for a large suite of species, and to produce information that will assist park managers and cooperators in designing the park's long-term landbird monitoring program.

During our two field seasons (2003 and 2004), we counted 6,026 individual birds during 969 point counts conducted along 134 transects. Transects were well distributed across the park. We documented 95 bird species (including the Hermit-Townsend's Warbler hybrid) in the park during the field season. Seventy-eight of these species were detected during at least one point count, while the remaining 17 were recorded as incidental observations only at times other than during point counts. We also conducted detailed habitat assessments at each of the 969 survey points.

We present 'naïve' habitat-specific density estimates, unadjusted for differences in detectability, for all 78 species recorded during point counts. We also present habitat-specific density estimates, adjusted for species- and habitat-specific differences in detectability, for 45 species that were detected at least five times during point counts, as well as lists of all species detected in each of 17 habitats we sampled in the park. Although the results were rarely found to be statistically significant, we rank habitats with regard to a) the number of species detected in each (species richness) and b) the overall density of birds (all species pooled) estimated to occur in each, and find some substantial and perhaps surprising differences across park habitats. In particular, the two lowest elevation habitats harboring deciduous tree components (Conifer Deciduous Mix and Red Alder) ranked first (10.65 birds/ha—Conifer Deciduous Mix) and third (8.55 birds/ha—Red Alder) in overall density of birds. Also interesting was that the three major mid- and high-elevation forest types all ranked higher than the three major low- to mid-elevation forest types in overall density of birds. Mid- to high-elevation forest types include Pacific Silver Fir (7.82 birds/ha), Subalpine Fir (7.31 birds/ha), and Mountain Hemlock (7.00 birds/ha). Mid- to low-elevation forest types include Douglas-fir (6.53 birds/ha), Mixed Douglas-fir/Western Hemlock (6.48 birds/ha), and Western Hemlock (6.35 birds/ha). Surprisingly, the two shrub habitats were ranked among the lowest four habitats, with Mid-elevation Shrub at 4.88 birds/ha and High-elevation Shrub at 4.79 birds/ha. Park-wide bird density (all species pooled) was lower at Mount Rainier (6.2 birds per point) than both North Cascades (7.6 birds per point) and Olympic (6.6 birds per point). When pooled bird density is examined across shared habitats, Mount Rainier is lower across the board when compared to North Cascades, but interestingly, is slightly higher than at Olympic in 8 of 10 habitats. The difference between Mount Rainier and Olympic in pooled bird density is particularly noticeable in higher elevation habitats, with Mount Rainier having a density of 1.16 more individuals per hectare than Olympic (averaged values from all habitats including and above the Pacific Silver Fir zone).

Acknowledgments

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Introduction

Reported declines of many birds breeding in North America have stimulated interest in avian population trends and mechanisms driving those trends (DeSante and George 1994). The North American Breeding Bird Survey suggests that landbird populations in Pacific Northwest late-seral forests appear to be in serious decline (Sauer et al. 2003), and data from the national parks are particularly important for teasing out possible causes. The avifauna of Mount Rainier National Park has historically received very little systematic study, with just a few published accounts (e.g. Taylor and Shaw 1927; Grater 1951; Manuwal 1991). Although simple presence/absence data for birds in the park already exist (Smith et al. 1997), extant data are insufficient for adequately describing species/habitat relationships, producing quantitative estimates of habitat-specific bird density, or reliably extrapolating those estimates across the park's 953 km^2.

In September 2000, personnel from throughout the North Coast / Cascades Network met with landbird monitoring experts to produce recommendations for a long-term monitoring plan for landbirds (Siegel and Kuntz II, 2009). The panel recommended that each of the major parks in the network begin by initiating an inventory to elucidate spatial patterns of abundance for a large suite of species. Because birds are well-suited to serve as indicators of ecological change (Furness et al. 1993), these inventories could then serve as baselines for monitoring future ecological changes within the park, assessing the affects of future management actions on bird populations, and formulating efficient long-term bird monitoring strategies.

We designed this inventory project to determine habitat-specific density of landbirds during the breeding season at Mount Rainier National Park, using methods consistent with those employed in other parks across the North Coast / Cascades Network (Siegel et al 2009c; Siegel et al. 2009a; Siegel et al. 2009b).

Methods

Sampling Strategy

Based on the recommendations of our September 2000 workshop (Siegel and Kuntz II 2009), as well as a follow-up meeting in 2002 that included many of the workshop participants as well as additional Olympic National Park personnel, we sought to design an inventory strategy that would provide a balance between sampling habitats in proportion to their spatial extent in the park, and ensuring that even relatively rare habitats would be sampled well enough for us to characterize their bird communities. Because we knew that many sampling occasions would be missed due to rain and other logistic constraints, we also sought to generate substantially more point count transects than we could actually use.

After extensive discussions about sampling design with NPS and USGS personnel, we selected our transect start points according to the procedures described below. All GIS work was conducted by Darin Swinney at Olympic National Park, and habitat delineations were based on parkwide vegetation maps produced by Pacific Meridian Resources (1996).

Systematic Points. A systematic, park-wide 2.5 km grid was generated. Points were created from the midpoint of grid polygons. All points on glaciers, in unvegetated high-elevation areas, and on slopes > 35 degrees were discarded. Points were then plotted on topographic maps and subjectively inspected for accessibility; those that were deemed inaccessible due to cliffs, dangerous river crossings, or other barriers, were discarded. Two Red Alder sample points were randomly selected as 'supplemental' start points to boost this habitat's number of starting points, yielding 93 potential transect start points.

Trail Points. We expected that our crews would be able to complete approximately twice as many points per transect when working on trails versus working off-trail. We therefore decided to devote about a quarter of our sampling days to conducting transects along trails. Sixty-one trail transect start points were selected by a process that systematically selected segments of the park's routed trail coverage. We discarded trail segments with obvious accessibility problems and/or sustained amounts of switchbacks.

In preparation for the second field season we re-evaluated all remaining trail segments in order to focus on those that ran through areas of under-sampled habitat for substantial portions of their length.

Supplemental Points. Following the 2003 field season (Siegel et. al. 2004c), eight vegetation types were found to have been poorly sampled. In the winter of 2003-2004 we selected additional transect start points within these habitats. To select these supplemental points we applied a three-by-three majority filter to the PMR vegetation map. All post-filtered polygons in each habitat greater than 0.5 acres in size and falling on slopes <35° were selected to be in the sample frame. A predetermined number of polygons from each habitat were selected randomly. Mid-points of each polygon were selected as the transect starting point. Points were over-sampled to provide for accessibility problems and a firing order was established to guide in the selection of replacement points.

Data Collection

Conducting Point Counts. We conducted all fieldwork between May 23 and July 29 of 2003 and June 4 and July 30 of 2004. Crew members worked in pairs, and generally hiked into the backcountry for seven days at a time, during which they conducted transects on as many mornings as weather permitted. Prior to leaving for the field, crews were provided with coordinates and maps of at least six transect start points, selected such that each was generally no more than a one-day hike from another. Start points were assigned a randomly generated 'firing order' such that, logistic considerations aside, the decision of which points to complete when all points could not be completed was made randomly.

We used five-minute variable circular plot (VCP) point counts (Fancy and Sauer 2000, Siegel 2009) coupled with detailed habitat descriptions of each point count location as our primary means of surveying birds. VCP point counts entailed recording the horizontal distance, estimated to the nearest meter, to every bird seen or heard during the point count.

Each morning in the field, each two-person team conducted a transect of approximately 5-6 off-trail points or 10-12 on-trail points spaced 200 m apart. Transects began at pre-selected starting points which were located in the field with topographic maps and a hand-held GPS unit. Prior to starting the transect, one team member was designated the point count observer and the other was designated the vegetation observer. The point count observer flagged the trail from point to point as the transect was conducted; the vegetation observer then followed the trail of flagging, collecting vegetation data at the indicated point count locations. Vegetation observers were careful to remain at least 200 m behind the point count observer, to avoid influencing bird activity during the count. As a safety consideration, point count and vegetation observers remained in radio contact for the duration of the transect.

For on-trail transects, the observers completed their transect by collecting data at the starting point, and then proceeding along the trail in a pre-determined direction. For off-trail transects, observers chose the semi-cardinal direction (0°, 45°, 90°, etc.) that most closely approximated a perpendicular *toward* the nearest trail (on odd calendar days), or the semi-cardinal direction that most closely approximated a perpendicular *away* from the nearest trail (on even calendar days). Observers frequently encountered a river, cliff, or other barrier that prevented them from completing a transect along the intended compass bearing. In these cases they returned to the last successfully completed point, and then reoriented to the nearest semi-cardinal bearing that was not blocked by a barrier.

Point counts began within ten minutes of local sunrise, and continued until 3.5 hours after local sunrise. 'Flyovers'— defined as birds that flew over the top of the vegetation canopy, never touched down in the observer's field of view, and did not appear to be foraging, displaying, or behaving in any other way that might suggest a link to the habitat below— were tallied separately from other bird detections. Birds thought to have been recorded previously at another point were marked accordingly on the data forms. Geographical coordinates based on GPS readings and topographic maps were recorded at each sampling point, generally by the vegetation observer. We recorded whether each bird was initially detected during the first three minutes or last two minutes of the point count, in order to improve comparability with data from the Breeding Bird Survey (BBS) which utilizes three-minute counts. We also recorded whether each bird was initially detected visually or aurally, and whether the bird sang at any time during the count.

Additionally, whenever crew members detected species thought to be rare or difficult to sample in the park, they completed "Rare Bird Report Forms", including descriptions of the birds' appearance and behavior and geographical coordinates. These reports covered not only birds detected during point counts, but also birds detected while sampling vegetation, hiking between transects, relaxing at camp in the evening, or at any other time during the field season. Although our project focused explicitly on diurnal passerine and near-passerine birds, we frequently used these rare bird report forms to record owls, raptors, and other species which were poorly sampled by our point count protocol, regardless of their actual rarity.

Sampling Vegetation at Bird Survey Points. Vegetation descriptions at each point entailed assigning a primary habitat classification to a circular 50-m radius plot centered on the point count station, and also collecting more detailed data on vegetation structure and composition

within two 20 m x 40 m subplots within that 50-m radius circle. Vegetation plots occasionally straddled more than one distinct habitat type; in these cases observers classified the point as being dominated by the habitat that covered the larger portion of the plot, and then additionally recorded the 'secondary' habitat present in the plot. Habitat classifications were based on the habitat categories described in the park's current GIS habitat coverage (Pacific Meridian Resources 1996), except that we added three categories that Pacific Meridian Resources did not use: Conifer Deciduous Mix (areas where the canopy was >20% conifer species and >20% deciduous species), Engelmann Spruce, and Grand Fir. Subsequent to data collection, however, we made some minor changes to the habitat classification system, in order to better delineate meaningful bird habitats:

1) We combined points that were classified in the field as 'Herbaceous Sedge Meadow' with points classified as 'Heather' to form a new category which we called 'Heather/Herbaceous Sedge Meadow'. We combined these two habitats into a single classification unit because a) we often encountered a mixture of heather and meadow plants on our plots, b) the documentation in Pacific Meridian Resources (1996) provides little guidance for how to classify such areas, and c) we saw no obvious differences in the bird communities inhabiting these plant communities.

2) We split points that were classified in the field as 'Shrub' into two distinct habitat categories, 'Mid-elevation Shrub' (<1280 m and/or comprising a generally mid-elevation plant community) and 'High-elevation Shrub' (>1280 m and/or comprising a generally high-elevation plant community). This was necessary because the avifauna within shrub-dominated areas of these two elevation zones differed markedly, even though Pacific Meridian Resources (1996) mapped them as belong to the same plant community.

During the 2003 field season we also classified vegetation plots according to the "Franklin Key" (Franklin et al. 1988), but our crews were often unable to confidently age the forest stands (a necessary step in using the key), so we did not use them in the data analysis, and we stopped recording them after the 2003 field season.

We also collected more detailed information describing habitat structure and composition within each of two 20 m x 40 m subplots adjacent to the point count station. The first subplot straddled the line of travel walked by the vegetation observer as (s)he approached the point count station, beginning 50 m from the station and ending 10 m from the station. The second subplot straddled the line of travel walked as the observer left the point count station, beginning 10 m from the station and ending 50 m from the station.

Within each plot we assessed the composition and structure of both the canopy and the understory. For the canopy, we estimated the average canopy height and subcanopy height, if a subcanopy was present. We tallied all trees by size class and species, and also counted snags and downed logs. For the understory we estimated the percent cover contributed by each constituent species of woody plant, and also estimated the percent cover of each component of groundcover, including living as well as non-living elements. More detail about the habitat parameters we measured is provided in Appendix C.

Crew Training and Testing

At the beginning of each field season, we provided our field crew with an intensive two-week training program at Olympic and North Cascades National Parks, where the low-elevation habitats allowed better birding earlier in the season than was available at Mount Rainier. We trained our crew members, who generally had prior experience birding and conducting biological fieldwork, in visual and aural bird identification, distance estimation, plant identification, orienteering, backcountry safety, and project protocols. Crew members honed their bird identification skills by spending days in the field birding and practicing point counts with experienced trainers, and then reviewing at night with the aid of field guides, taped songs and calls, and an instructional CD-ROM. At the end of the two-week training period, we gave all crew members a rigorous exam involving the identification of approximately 100 taped songs and calls (some of them grouped together in rapid succession to produce 'simulated point counts') as well as 30-40 photographic images (generally of rarer species or less obvious female plumages). Crew members were not permitted to conduct point counts (they worked solely as vegetation observers instead) until they passed the exam, which was altered for each administration. Passing the exam, which required a near-perfect score, ensured that observers could competently identify by sight and sound all species expected to occur in the park.

Data Analysis

All data were entered into DBASE databases, which we then checked for errors using an array of automated and manual data verification routines. Copies of these databases are being submitted along with this report.

Within each habitat, each species' apparent density, uncorrected for detectability, was calculated as

$$\frac{d_{50}/p_{hab})}{0.7854},$$

where d_{50} is the total number of 50-m radius detections tallied at all points in that habitat, p_{hab} is the total number of points sampled within that habitat type, and 0.7854 is the portion of a hectare covered by a 50-m radius circle

The effective detection radius for birds during point counts has been shown to vary across habitats and between species (Burnham 1981; Barker and Sauer 1995). Because vegetative structure differs dramatically across park habitats, it is necessary to correct for inter-habitat variability in detectability before densities can be compared across habitats (Buckland et al. 2001). Additionally, some species vocalize much more loudly than others, so detectability corrections must be performed on a species by species basis. We used the computer program DISTANCE 4.0 Release 2 (Thomas et al. 2002) to correct for inter-habitat differences in detectability and to produce estimates of absolute density for all species detected at least ten times during point counts.

Distance-sampling experts generally advise that at least 60-80 detections are necessary for reliably modeling the relationship between detection probability and distance from the observer

(Buckland et al. 2001). We amassed 60 or more detections in a single habitat type for just a small suite of species, so for the purpose of modeling detection probability, we pooled habitats into two general habitat groups, based on vegetation structure and, presumably, likelihood of detecting birds at moderate or large distances:

> Habitat Group 1--densely vegetated habitats: Red Alder, Conifer Deciduous Mix, Western Redcedar, Douglas-fir, Douglas-fir/Western Hemlock, Western Hemlock, Engelmann Spruce, Grand Fir, Noble Fir, Pacific Silver Fir.
>
> Habitat Group 2--sparsely vegetated habitats: Mid-elevation Shrub, High-elevation Shrub, Alaska Yellow Cedar, Mountain Hemlock, Subalpine Fir, Heather/Herbaceous Sedge Meadow, Rock or Sparsely Vegetated.

Within each habitat group, we used DISTANCE to fit detection functions for each species detected at least 60 times in the pooled habitats that constituted that group. We set the data filter to truncate the largest 10% of observations (Buckland et al. 2001), and then fit models using the half-normal key function and both the cosine and polynomial series expansions. We used the Akaike Information Criterion (AIC) to select among models with different forms and numbers of expansion terms (Akaike 1973; Burnham and Anderson 1998). We then applied the habitat group detection function separately to the data in each of the constituent habitats within that group, to produce habitat-specific estimates of absolute abundance, taking into account species- and habitat-specific variation in detectability.

For species that were detected at least five times in the park, but fewer than 60 times in one or both habitat groups, we used detectability functions generated from observations of the same species at Olympic National Parks (Siegel et al. 2009a) or North Cascades (Siegel et. al. 2009b) to adjust our density estimates at Mount Rainier National Park. We did this by fitting the uniform key function with no adjustment terms, and using 'borrowed' estimates of detection probability and detection probability variance from the North Cascades analyses as multipliers (Thomas et al. 2002). However, many species that were relatively rare at Mount Rainier National Park were also relatively rare at North Cascades and Olympic National Parks, and consequently we were unable to model detectability functions for them at either park. For such species that were detected at least five times at Mount Rainier National Park, we matched them with 'surrogate species'—species with similar song volume, song pitch, and/or singing location (e.g. high in the canopy) that were detected at least 60 times within a habitat group. We then used the detection probability and detection probability variance of the 'surrogate' species in the same way described above. For a small number of species in which there was no suitable species match to use for a surrogate from another park, but there were more than 60 detections across the three large North Coast Cascades Network parks, we pooled detections across the three parks to establish network-wide parameters for modeling detectability. Those parameters were then applied to the Mount Rainier National Park data in the same was as described above in the case of surrogate species.

To compare the overall density of birds (all species pooled) across habitats, we summed the adjusted density estimates for all species within each habitat. This method likely underestimates the true density slightly, since we produced adjusted density estimates for just 45 of the 78 species detected during point counts. The bias should be minimal however, as all but a few of

the species for which we did not produce adjusted density estimates were quite rare in the park, and consequently have little effect on overall bird density

Results and Discussion

Scope of Work Accomplished

We recorded 6,026 individual birds during 969 point counts conducted along 134 transects (Fig. 1). During our 94 off-trail transects, we completed an average of 5.5 points per transect, similar to the average of 5.3 points per transect we obtained in North Cascades National Park (Siegel et al. 2009b) and slightly lower than the average of 6.0 points per transect we obtained in Olympic National Park (Siegel et al. 2009a). As we expected, we were able to complete substantially more points per transect when we conducted on-trail transects. During our 27 on-trail transects, we averaged 11.3 points per transect.

Although most of the habitats at Mount Rainier are relatively restricted, with just a few covering broad sections of the park, the final point totals in each habitat show at least minimally adequate (greater than 20 points sampled) sampling in 12 of 17 habitats (Table 1). In fact, 10 of the 17 habitats have at last 30 points sampled. We consider this a success given the decision that point totals were so low following the first year of data collection (just seven habitats with greater than 20 points sampled) that we decided to focus almost exclusively on under-sampled habitats in the second year. Locations of our completed sampling points in each habitat are presented in Figures 2 – 17.

Bird Species Detected in the Park

We documented 95 species (including the Townsend's-Hermit Warbler hybrid) in the park (Table 2). Seventeen of the species we detected were never actually recorded during point counts, but instead were observed incidentally at other times by our crew members while they were hiking or camping.

Density Estimates

Seventy-eight of the 95 species we recorded in the park were detected during at least one point count. We estimated habitat-specific density, accounting for species- and habitat-specific variability in detectability, for 45 of them (Table 3). Although we detected several additional species at least five times during point counts, we elected not to estimate their density because some aspect of their behavior or distribution makes density estimation using our methods questionable. These included Vaux's Swift, and Violet-green Swallow because they typically range over large distances within a short time period, and Rufous Hummingbird because the species was clearly attracted to our flagging.

Tables 4-20 provide lists of each species detected during point counts in each habitat. The tables also provide:

1) the number of points with detections (including flyovers) of each species within each habitat,

2) the number of detections (excluding flyovers) of each species within each habitat,

3) the number of non-flyover detections within 50 m of the observer of each species in each habitat (used to calculated the unadjusted density),

4) the 'unadjusted density' of each species (based only on the number of detections within 50 m of the observer, and incorporating no correction for species- or habitat-specific variation in detectability),

5) the adjusted density estimate, which takes into account habitat- and species-specific variation in detectability, for each species recorded at least five times park-wide during point counts, and

6) the coefficient of variation, degrees of freedom, and 95% confidence interval associated with each adjusted density estimate.

To provide an easy way to compare species-specific densities across habitats, Tables 21-64 present nearly the same data as described above for all 45 species for which we produced adjusted density estimates, organized by species rather than habitat and with the percent of points with detections rather than the number of points with detections.

The overall density of birds (all species pooled) varied greatly across park habitats (Table 65). In particular, the two lowest elevation habitats harboring deciduous tree components (Conifer Deciduous Mix and Red Alder) ranked first (9.19 birds/ha—Conifer Deciduous Mix) and third (8.04 birds/ha—Red Alder) overall. Also interesting was that the three major mid- and high-elevation forest types all ranked higher than the three major low- to mid-elevation forest types. Mid- to high-elevation forest types include Pacific Silver Fir (7.75 birds/ha), Subalpine Fir (7.61 birds/ha), and Mountain Hemlock (7.38 birds/ha). Mid- to low- elevation forest types include Douglas-fir (6.61 birds/ha), Mixed Douglas-fir/Western Hemlock (6.54 birds/ha), and Western Hemlock (6.13 birds/ha). Surprisingly, the two shrub habitats were ranked among the lowest four habitats overall, with High-elevation Shrub at 6.28 birds/ha and Mid-elevation Shrub at 5.08 birds/ha.

The number of species detected in each habitat also varied greatly (Table 66), though we caution that these results are not straightforward to interpret, as they are heavily confounded by variable survey effort across habitats, an issue which has much less bearing on the relative density estimates described above. While there is no reason to expect density estimates to increase with the number of points sampled, we would indeed expect to see such a relationship between the number of species detected and the number of points sampled. Table 66 is, thus, best interpreted by looking at the obvious exceptions to this general pattern. The highest species total was Douglas-fir with 42 species; an interesting result given that Douglas-fir was sampled with 78 fewer points than Western Hemlock, the habitat with the highest number of points sampled. The lowest species total was for Noble Fir (17 species), a habitat that was sampled with just 15

points. The largest exception to the general trend of detecting more species in better sampled habitats occurs in the Rock or Sparsely Vegetated habitat category. With only 52 points sampled, this habitat has the third highest species total (39 species). This is most likely explained by the broad elevation zone covered by the habitat, from low elevation rocky river washes to high rocky ridge lines and outcroppings. All other habitats are restricted to a well defined elevation zone.

Overall density of birds was substantially lower at Mount Rainier National Park than at North Cascades National Park (Siegel et al. 2009b), and slightly lower than at Olympic National Park (Siegel et al. 2009a). Across the entire park, we detected an average of 7.6 birds per point at North Cascades, 6.6 birds per point at Olympic, and 6.2 birds per point at Mount Rainier. This amounts to an 18% difference when compared to North Cascades and a 6% difference when compared to Olympic. When pooled densities are compared just between shared habitats across parks, Mount Rainier does not rank higher in any habitat when compared to North Cascades (the closest being Pacific Silver Fir with 8.54 birds per point at North Cascades and 7.75 birds per point at Mount Rainier). When compared with Olympic, most habitats in Mount Rainier have a slightly higher density, particularly at higher elevations. Pooled species density is most similar in Heather/Herbaceous Sedge Meadow habitat (6.63 birds per point at Mount Rainier compared to 6.05 birds per point in Olympic) and most different in Mountain Hemlock and High Elevation Shrub (a 1.38 birds per point difference in each). At lower elevations, densities appear very similar between Mount Rainier and Olympic, but are difficult to compare directly due to the lack of lower elevation (< 600 m) habitat at Mount Rainier.

Comparison of habitat-specific densities of selected species across parks reveals some interesting differences between Mount Rainier, North Cascades, and Olympic. Species in Mount Rainier lack the strong preference for Douglas-fir forest that is found in North Cascades, where eight species occur in significantly higher densities when compared with Western Hemlock forests (Siegel et al. 2009b). In Mount Rainier only Townsend's Warbler exhibits a preference for Douglas-fir habitat over Western Hemlock. Also interesting is that habitat preferences between Douglas-fir and Western Hemlock habitats for Hammond's and Pacific-slope Flycatcher differed in Mount Rainier. Of the three parks, Hammond's Flycatcher is found in higher densities than Pacific-slope Flycatcher in both habitats in North Cascades; Pacific-slope is found in higher densities than Hammond's Flycatcher in both habitats in Olympic; however, in Mount Rainier Hammond's Flycatcher is found in higher densities in Douglas-fir while Pacific-slope Flycatcher is found in higher densities in Western Hemlock. Examining these habitat relationships both within and between parks is worthy of further investigation. Indeed, the vegetation data we collected at each sampling point provide a wealth of opportunity for further analyses of species-habitat relationships at Mount Rainier, and across the North Coast Cascades Network.

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Table 1. Number of off-trail, on-trail, and total points counts conducted in each major habitat at Mount Rainier National Park.

Habitat	Off-trail	On-trail	Total
Western Hemlock	88	102	190
Pacific Silver Fir	72	64	136
Douglas-fir	72	40	112
Mixed Douglas-fir/Western Hemlock	70	41	111
Heather/Herbaceous Sedge Meadow	26	78	104
Subalpine fir	36	40	76
Rock or Sparsely Vegetated	21	31	52
Mid-elevation Shrub	37	5	42
High-elevation Shrub	9	21	30
Mountain Hemlock	18	12	30
Conifer Deciduous Mix	22	3	25
Red Alder	19	2	21
Noble Fir	14	1	15
Western Redcedar	6	1	7
Engelmann Spruce	0	7	7
Alaska Yellow Cedar	3	3	6
Grand Fir	5	0	5
Total	518	451	969

Table 2. All bird species detected by IBP staff at Mount Rainier National Park during the 2003 and 2004 field seasons. Asterisks indicate species that were documented by our crew members but were never detected during point counts.

1. Great Blue Heron*	33. Northern Flicker	65. Varied Thrush
2. Turkey Vulture*	34. Pileated Woodpecker	66. American Pipit
3. Canada Goose	35. Olive-sided Flycatcher	67. Cedar Waxwing
4. Mallard*	36. Western Wood-Pewee	68. Orange-crowned Warbler
5. Harlequin Duck*	37. Hammond's Flycatcher	69. Yellow Warbler
6. Osprey	38. Dusky Flycatcher	70. Yellow-rumped Warbler
7. Northern Harrier*	39. Pacific-slope Flycatcher	71. Black-throated Gray Warbler
8. Sharp-shinned Hawk	40. Hutton's Vireo*	72. Townsend's Warbler
9. Northern Goshawk*	41. Warbling Vireo	73. Townsend's x Hermit Warbler Hybrid
10. Red-tailed Hawk	42. Gray Jay	
11. Rough-legged Hawk*	43. Steller's Jay	74. Hermit Warbler
12. Golden Eagle*	44. Clark's Nutcracker	75. MacGillivray's Warbler
13. American Kestrel	45. American Crow	76. Common Yellowthroat
14. Merlin*	46. Common Raven	77. Wilson's Warbler
15. White-tailed Ptarmigan	47. Tree Swallow	78. Western Tanager
16. Blue Grouse	48. Violet-green Swallow	79. Spotted Towhee
17. Spotted Sandpiper	49. Barn Swallow	80. Chipping Sparrow
18. Marbled Murrelet	50. Mountain Chickadee	81. Fox Sparrow
19. Band-tailed Pigeon	51. Chestnut-backed Chickadee	82. Song Sparrow
20. Western Screech-Owl*	52. Bushtit*	83. Lincoln's Sparrow
21. Great Horned Owl*	53. Red-breasted Nuthatch	84. White-crowned Sparrow
22. Northern Pygmy-Owl	54. Brown Creeper	85. Dark-eyed Junco
23. Barred Owl	55. Canyon Wren	86. Black-headed Grosbeak
24. Common Nighthawk*	56. Winter Wren	87. Red-winged Blackbird
25. Black Swift*	57. American Dipper	88. Brown-headed Cowbird
26. Vaux's Swift	58. Golden-crowned Kinglet	89. Gray-crowned Rosy-Finch
27. Rufous Hummingbird	59. Ruby-crowned Kinglet	90. Pine Grosbeak
28. Belted Kingfisher	60. Mountain Bluebird	91. Cassin's Finch
29. Red-breasted Sapsucker	61. Townsend's Solitaire	92. Red Crossbill
30. Downy Woodpecker	62. Swainson's Thrush	93. Pine Siskin
31. Hairy Woodpecker	63. Hermit Thrush	94. American Goldfinch*
32. Three-toed Woodpecker*	64. American Robin	95. Evening Grosbeak

Table 3. Species for which we estimated habitat-specific density in densely vegetated and/or sparsely vegetated habitats. 'Self' indicates species for which we amassed at least 60 detections within a habitat group (densely vegetated habitats or sparsely vegetated habitats) and were able to model detectability without using data from 'surrogate' species or data from other parks. For species that were detected less frequently (but at least five times) at Mount Rainier National Park, we modeled detectability using data from the same species or a more frequently encountered species at either North Cascades NP, Olympic NP, Mount Rainier NP, or pooled data from all three North Coast/Cascades Network National Parks.

	Source of Parameter Values for Detectability Adjustments[1]							
	Densely Vegetated Habitats				Sparsely Vegetated Habitats			
		Sample	Detection Probability			Sample	Detection Probability	
Species	Species	Width (m)	Estimate	SE	Species	Width (m)	Estimate	SE
Blue Grouse	Blue Grouse [2]	210	0.1957	0.0280	Blue Grouse [3]	151	0.2213	0.0272
Spotted Sandpiper	Dark-eyed Junco[4]	80	0.4106	0.0376	Dark-eyed Junco[4]	88	0.1903	0.0175
Marbled Murrelet	Olive-sided Flycatcher[2]	143	0.2951	0.1038	not detected			
Band-tailed Pigeon	Blue Grouse[2]	210	0.1957	0.0280	not detected			
Hairy Woodpecker	Hairy Woodpecker [3]	95	0.2632	0.0295	American Robin[4]	125	0.3432	0.0537
Northern Flicker	Northern Flicker [3]	150	0.3603	0.1419	Northern Flicker [3]	162	0.4015	0.1404
Pileated Woodpecker	Pileated Woodpecker [3]	227	0.2059	0.0227	Northern Flicker[3]	162	0.4015	0.1404
Olive-sided Flycatcher	Olive-sided Flycatcher [2]	143	0.2951	0.1038	Olive-sided Flycatcher [3]	220	0.2529	0.2574
Hammond's Flycatcher	self	55	0.5065	0.0769	Pacific-slope Flycatcher[3]	75	0.5543	0.1212
Pacific-slope Flycatcher	self	74	0.3811	0.0366	Pacific-slope Flycatcher [3]	75	0.5543	0.1212
Warbling Vireo	Warbling Vireo [2]	99	0.3458	0.3187	American Robin[4]	125	0.3432	0.0537
Gray Jay	self	80	0.2893	0.0654	Townsend's Warbler[2]	100	0.3460	0.0505
Steller's Jay	Steller's Jay[2]	180	0.2008	0.0242	Hermit Thrush[4]	175	0.5415	0.2470
Clark's Nutcracker	American Robin[4]	102	0.4859	0.0901	Clark's Nutcracker [3]	333	0.1007	0.0143
Common Raven	Common Raven [3]	229	0.3541	0.0449	Hermit Thrush[4]	175	0.5415	0.2470
Mountain Chickadee	American Robin[4]	102	0.4859	0.0901	Hermit Thrush[4]	175	0.5415	0.2470
Chestnut-backed Chickadee	self	48	0.4608	0.0766	self	50	0.4024	0.0611
Red-breasted Nuthatch	self	120	0.5503	0.3115	self	110	0.4609	0.1758
Brown Creeper	self	52	0.5061	0.0829	Golden-crowned Kinglet[4]	39	0.3712	0.0603
Winter Wren	self	100	0.3947	0.0222	self	87	0.3522	0.0993
Golden-crowned Kinglet	self	40	0.5224	0.0345	self	39	0.3712	0.0603
Ruby-crowned Kinglet	Townsend's Warbler[4]	89	0.6137	0.0682	Townsend's Warbler[2]	100	0.3460	0.0505
Mountain Bluebird	not detected				Pine Siskin[4]	100	0.4953	0.1488
Swainson's Thrush	self	120	0.4813	0.1040	Hermit Thrush[4]	175	0.5415	0.2470
Hermit Thrush	self	130	0.5734	0.2394	self	175	0.5415	0.2470
American Robin	self	102	0.4859	0.0901	self	125	0.3432	0.0537

Table 3. Species for which we estimated habitat-specific density in densely vegetated and/or sparsely vegetated habitats. 'Self' indicates species for which we amassed at least 60 detections within a habitat group (densely vegetated habitats or sparsely vegetated habitats) and were able to model detectability without using data from 'surrogate' species or data from other parks. For species that were detected less frequently (but at least five times) at Mount Rainier National Park, we modeled detectability using data from the same species or a more frequently encountered species at either North Cascades NP, Olympic NP, Mount Rainier NP, or pooled data from all three North Coast/Cascades Network National Parks (continued).

	Source of Parameter Values for Detectability Adjustments[1]							
	Densely Vegetated Habitats				Sparsely Vegetated Habitats			
		Sample	Detection Probability			Sample	Detection Probability	
Species	Species	Width (m)	Estimate	SE	Species	Width (m)	Estimate	SE
Varied Thrush	self	150	0.5770	0.0426	self	160	0.4656	0.0227
American Pipit	American Pipit[5]	90	0.3799	0.0629	not detected			
Yellow Warbler	Yellow Warbler[2]	76	0.3521	0.0348	Yellow-rumped Warbler[2]	119	0.2391	0.0355
Yellow-rumped Warbler	Yellow-rumped Warbler[2]	95	0.4093	0.0735	Yellow-rumped Warbler[2]	119	0.2391	0.0355
Black-thrtd. Gray Warbler	Black-thrtd. Gray Warbler[2]	87	0.3810	0.0373	Townsend's Warbler[2]	100	0.3460	0.0505
Townsend's Warbler	self	89	0.6137	0.0682	Townsend's Warbler[2]	100	0.3460	0.0505
MacGillivray's Warbler	MacGillivray's Warbler[2]	81	0.4027	0.1192	Townsend's Warbler[2]	100	0.3460	0.0505
Wilson's Warbler	Wilson's Warbler[5]	75	0.4330	0.0473	Yellow-rumped Warbler[2]	119	0.2391	0.0355
Western Tanager	Western Tanager[2]	105	0.3540	0.0543	American Robin[4]	125	0.3432	0.0537
Chipping Sparrow	Chipping Sparrow[2]	93	0.2502	0.0298	Chipping Sparrow[2]	80	0.5869	0.1316
Fox Sparrow	Song Sparrow[2]	125	0.1682	0.0389	Fox Sparrow[2]	195	0.1566	0.0400
Song Sparrow	Song Sparrow[2]	125	0.1682	0.0389	Fox Sparrow[2]	195	0.1566	0.0400
Lincoln's Sparrow	not detected				Dark-eyed Junco[4]	88	0.1903	0.0175
Dark-eyed Junco	self	80	0.4106	0.0376	self	88	0.1903	0.0175
Red-winged Blackbird	Song Sparrow[2]	125	0.1682	0.0389	not detected			
Gray-crowned Rosy-Finch	not detected				Pine Siskin[4]	100	0.4953	0.1488
Red Crossbill	Red Crossbill[2]	90	0.2165	0.3192	Red Crossbill[5]	89	0.4217	0.0652
Pine Siskin	self	84	0.4909	0.0618	self	100	0.4953	0.1488
Evening Grosbeak	Evening Grosbeak[2]	115	0.2381	0.0362	Yellow-rumped Warbler[2]	119	0.2391	0.0355

[1]Parameter values calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.
[2]Indicates detectability was modeled using data from North Cascades National Park.
[3]Indicates detectability was modeled using pooled data from all three North Coast/Cascades Network National Parks.
[4]Indicates detectability was modeled using data from Mount Rainier National Park.
[5]Indicates detectability was modeled using data from Olympic National Park.

Table 4. Results from 21 point counts at locations classified as Red Alder. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Spotted Sandpiper	1	1	0	0.00	**0.06**	100.4	20	0.01	0.33
Rufous Hummingbird	1	1	1	0.06	**--**				
Hairy Woodpecker	1	1	1	0.06	**0.06**	100.6	20	0.01	0.37
Hammond's Flycatcher	9	12	11	0.67	**1.09**	32.1	33	0.58	2.06
Pacific-slope Flycatcher	5	6	4	0.24	**0.44**	43.9	22	0.18	1.04
Warbling Vireo	7	9	3	0.18	**0.36**	35.0	20	0.18	0.73
Steller's Jay	3	3	1	0.06	**0.07**	56.1	20	0.02	0.21
Common Raven	3	3	0	0.00	**0.02**	70.1	20	<0.01	0.06
Chestnut-backed Chickadee	10	15	15	0.91	**2.14**	30.7	40	1.17	3.93
Brown Creeper	3	4	4	0.24	**0.44**	60.9	23	0.14	1.42
Winter Wren	9	12	2	0.12	**0.46**	31.5	21	0.24	0.87
Golden-crowned Kinglet	5	5	5	0.30	**0.91**	40.5	21	0.40	2.04
Swainson's Thrush	8	9	5	0.30	**0.20**	37.3	41	0.10	0.41
American Robin	1	2	1	0.06	**0.06**	101.7	21	0.01	0.35
Varied Thrush	5	7	1	0.06	**0.08**	43.7	21	0.03	0.20
Yellow Warbler	1	1	1	0.06	**0.07**	100.5	20	0.01	0.43
Black-throated Gray Warbler	2	2	2	0.12	**0.11**	69.6	20	0.03	0.39
Townsend's Warbler	6	12	5	0.30	**0.37**	39.0	24	0.17	0.81
Wilson's Warbler	4	5	3	0.18	**0.31**	50.6	20	0.11	0.84
Western Tanager	1	1	1	0.06	**0.04**	101.2	20	0.01	0.22
Song Sparrow	2	3	3	0.18	**0.17**	76.6	20	0.04	0.71
Dark-eyed Junco	8	10	7	0.42	**0.58**	32.5	24	0.30	1.11

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 5. Results from 25 point counts at locations classified as Conifer Deciduous Mix. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

					Adjusted Density[6]				
Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	**Estimate (birds/ha)**	CV	df	Lower 95% C.I.	Upper 95% C.I.
Canada Goose	1	1	0	0.00	**--**				
Vaux's Swift	2	2	1	0.05	**--**				
Rufous Hummingbird	3	3	3	0.15	**--**				
Pileated Woodpecker	2	2	0	0.00	**0.02**	70.1	24	0.01	0.09
Hammond's Flycatcher	8	10	9	0.46	**0.75**	38.5	33	0.35	1.59
Pacific-slope Flycatcher	15	22	19	0.97	**1.34**	22.2	36	0.86	2.10
Warbling Vireo	8	10	4	0.20	**0.38**	33.6	24	0.19	0.74
Steller's Jay	6	6	2	0.10	**0.12**	38.3	24	0.05	0.25
Common Raven	2	2	0	0.00	**0.01**	70.4	24	0.00	0.05
Tree Swallow	1	1	0	0.00	**--**				
Chestnut-backed Chickadee	16	31	30	1.53	**3.60**	25.9	68	2.17	5.98
Red-breasted Nuthatch	5	6	0	0.00	**0.08**	75.5	100	0.02	0.31
Brown Creeper	1	1	0	0.00	**0.00**				
Winter Wren	14	20	11	0.56	**0.58**	22.7	27	0.37	0.92
American Dipper	1	1	1	0.05	**--**				
Golden-crowned Kinglet	4	4	2	0.10	**0.15**	100.2	24	0.03	0.85
Swainson's Thrush	9	13	6	0.31	**0.20**	38.9	46	0.10	0.43
Hermit Thrush	3	4	2	0.10	**0.05**	72.3	52	0.01	0.19
American Robin	4	5	2	0.10	**0.13**	53.3	31	0.05	0.35
Varied Thrush	7	7	1	0.05	**0.06**	37.1	26	0.03	0.12
Black-throated Gray Warbler	2	2	2	0.10	**0.09**	69.9	24	0.02	0.32
Townsend's Warbler	7	10	6	0.31	**0.26**	37.1	29	0.13	0.55
MacGillivray's Warbler	1	1	1	0.05	**0.05**	104.3	24	0.01	0.28
Wilson's Warbler	2	2	1	0.05	**0.10**	70.1	24	0.03	0.39
Song Sparrow	6	8	4	0.20	**0.39**	45.5	24	0.16	0.95
Dark-eyed Junco	9	13	11	0.56	**0.63**	32.9	28	0.33	1.22

Table 5. Results from 25 point counts at locations classified as Conifer Deciduous Mix. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red-winged Blackbird	1	1	0	0.00	**0.05**	102.6	24	0.01	0.28
Red Crossbill	3	4	1	0.05	**0.15**	70.8	24	0.04	0.54

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 6. Results from 5 point counts at locations classified as Grand Fir.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Hammond's Flycatcher	1	2	0	0.00	**0.42**	101.2	4	0.04	4.10
Pacific-slope Flycatcher	2	5	3	0.76	**1.22**	62.0	4	0.26	5.77
Warbling Vireo	2	2	0	0.00	**0.38**	61.9	4	0.08	1.83
Gray Jay	1	1	1	0.25	**0.34**	102.5	4	0.04	3.32
Steller's Jay	1	1	1	0.25	**0.10**	100.7	4	0.01	1.00
Common Raven	1	1	0	0.00	**0.03**	100.8	4	<0.01	0.35
Chestnut-backed Chickadee	4	5	3	0.76	**1.80**	68.7	5	0.35	9.38
Red-breasted Nuthatch	1	1	0	0.00	**0.08**	114.9	7	0.01	0.71
Winter Wren	1	1	0	0.00	**0.16**	100.2	4	0.02	1.62
Swainson's Thrush	1	1	0	0.00	**0.09**	102.3	4	0.01	0.89
Hermit Thrush	1	2	0	0.00	**0.13**	108.4	6	0.02	1.19
American Robin	1	1	0	0.00	**0.13**	101.7	4	0.01	1.23
Black-throated Gray Warbler	1	2	0	0.00	**0.22**	100.5	4	0.02	2.25
Townsend's Warbler	4	9	1	0.25	**1.05**	33.8	5	0.45	2.43
Fox Sparrow	1	1	1	0.25	**0.24**	102.6	4	0.02	2.55
Dark-eyed Junco	1	2	1	0.25	**0.49**	100.4	4	0.05	4.85
Pine Siskin	1	2	1	0.25	**0.37**	100.8	4	0.04	3.65

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details.

Table 7. Results from 190 point counts at locations classified as Western Hemlock. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Osprey	1	1	0	0.00	--				
Blue Grouse	1	1	0	0.00	**<0.01**	101.0	189	<0.01	0.01
Marbled Murrelet	4	5	0	0.00	**0.01**	70.4	189	<0.01	0.04
Band-tailed Pigeon	3	4	2	0.01	**0.01**	75.7	189	<0.01	0.02
Vaux's Swift	5	8	6	0.04	--				
Rufous Hummingbird	4	4	4	0.03	--				
Red-breasted Sapsucker	1	1	0	0.00	--				
Downy Woodpecker	1	1	0	0.00	--				
Hairy Woodpecker	4	4	3	0.02	**0.03**	50.9	189	0.01	0.07
Northern Flicker	4	4	1	0.01	**0.01**	63.3	189	<0.01	0.03
Pileated Woodpecker	5	5	2	0.01	**0.01**	45.6	189	<0.01	0.02
Hammond's Flycatcher	20	22	19	0.13	**0.22**	28.8	279	0.13	0.38
Pacific-slope Flycatcher	48	69	43	0.29	**0.47**	17.9	315	0.33	0.66
Warbling Vireo	4	5	1	0.01	**0.02**	61.7	189	0.01	0.06
Gray Jay	12	16	8	0.05	**0.12**	41.3	235	0.05	0.26
Steller's Jay	10	10	1	0.01	**0.03**	33.1	189	0.01	0.05
Common Raven	7	10	3	0.02	**0.01**	48.0	189	<0.01	0.02
Violet-green Swallow	1	1	1	0.01	--				
Chestnut-backed Chickadee	110	168	145	0.97	**2.27**	18.8	671	1.58	3.28
Red-breasted Nuthatch	30	36	8	0.05	**0.07**	59.8	194	0.03	0.22
Brown Creeper	18	19	17	0.11	**0.22**	28.9	248	0.13	0.39
Winter Wren	131	197	90	0.60	**0.74**	8.5	479	0.63	0.87
Golden-crowned Kinglet	44	51	50	0.34	**0.94**	17.7	248	0.67	1.33
Ruby-crowned Kinglet	1	1	1	0.01	**<0.01**	100.6	189	<0.01	0.02
Swainson's Thrush	9	12	1	0.01	**0.03**	42.5	236	0.01	0.07
Hermit Thrush	28	38	7	0.05	**0.06**	46.3	242	0.03	0.14
American Robin	9	9	2	0.01	**0.03**	37.5	230	0.02	0.06
Varied Thrush	95	156	16	0.11	**0.19**	11.7	440	0.15	0.24
Townsend's Warbler	24	37	13	0.09	**0.12**	24.3	285	0.07	0.19
Western Tanager	4	5	1	0.01	**0.02**	51.9	189	0.01	0.05

Table 7. Results from 190 point counts at locations classified as Western Hemlock. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Song Sparrow	2	2	0	0.00	**0.01**	102.6	189	<0.01	0.03
Dark-eyed Junco	41	52	28	0.19	**0.27**	19.3	291	0.19	0.40
Red-winged Blackbird	1	1	0	0.00	**0.01**	102.6	189	<0.01	0.03
Red Crossbill	11	13	5	0.03	**0.11**	37.6	189	0.05	0.22
Pine Siskin	18	22	9	0.06	**0.07**	33.7	245	0.04	0.14
Evening Grosbeak	4	7	2	0.01	**0.03**	63.9	189	0.01	0.10

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 8. Results from 7 point counts at locations classified as Western Redcedar.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Hammond's Flycatcher	1	1	0	0.00	**0.00**				
Pacific-slope Flycatcher	5	6	3	0.55	**1.09**	41.1	7	0.42	2.80
Warbling Vireo	2	2	1	0.18	**0.27**	65.2	6	0.06	1.15
Gray Jay	1	1	0	0.00	**0.25**	102.5	7	0.03	1.87
Steller's Jay	2	3	2	0.36	**0.21**	70.4	6	0.04	0.99
Chestnut-backed Chickadee	4	6	5	0.91	**2.14**	53.0	7	0.67	6.86
Winter Wren	3	4	0	0.00	**0.23**	64.8	6	0.05	0.98
Golden-crowned Kinglet	1	1	1	0.18	**0.54**	100.2	6	0.07	4.17
Swainson's Thrush	1	1	1	0.18	**0.07**	102.3	7	0.01	0.50
Hermit Thrush	1	1	1	0.18	**0.05**	108.4	8	0.01	0.35
American Robin	2	2	0	0.00	**0.18**	67.2	7	0.04	0.76
Varied Thrush	4	7	1	0.18	**0.18**	40.7	6	0.07	0.45
Townsend's Warbler	2	2	1	0.18	**0.19**	65.5	6	0.04	0.79
Song Sparrow	1	1	0	0.00	**0.17**	102.6	6	0.02	1.38

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details.

Table 9. Results from 111 point counts at locations classified as Mixed Douglas-fir/Western Hemlock. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Canada Goose	0	0	0	0.00	--				
Blue Grouse	1	1	0	0.00	--				
Band-tailed Pigeon	3	8	4	0.05	**0.03**	69.6	110	0.01	0.09
Northern Pygmy-Owl	1	1	0	0.00	--				
Vaux's Swift	4	5	2	0.02	--				
Hairy Woodpecker	4	4	4	0.05	**0.05**	50.6	110	0.02	0.12
Northern Flicker	2	2	0	0.00	**0.01**	80.7	110	<0.01	0.03
Pileated Woodpecker	1	1	0	0.00	**<0.01**	100.6	110	<0.01	0.01
Olive-sided Flycatcher	1	1	0	0.00	**<0.01**	106.0	110	<0.01	0.03
Hammond's Flycatcher	10	13	9	0.10	**0.19**	41.9	142	0.09	0.41
Pacific-slope Flycatcher	19	27	17	0.20	**0.36**	26.2	144	0.22	0.60
Warbling Vireo	2	2	0	0.00	**0.02**	71.0	110	<0.01	0.06
Gray Jay	5	5	3	0.03	**0.08**	49.4	154	0.03	0.20
Steller's Jay	3	3	1	0.01	**0.01**	58.5	110	<0.01	0.04
Common Raven	2	2	0	0.00	**<0.01**	71.5	110	<0.01	0.01
Chestnut-backed Chickadee	64	110	94	1.08	**2.54**	20.1	542	1.72	3.75
Red-breasted Nuthatch	34	38	6	0.07	**0.12**	58.8	182	0.04	0.35
Brown Creeper	14	16	14	0.16	**0.31**	30.7	170	0.17	0.57
Winter Wren	61	94	42	0.48	**0.60**	12.2	175	0.47	0.76
Golden-crowned Kinglet	21	25	24	0.28	**0.76**	24.9	127	0.47	1.23
Swainson's Thrush	4	6	0	0.00	**0.03**	56.4	142	0.01	0.07
Hermit Thrush	24	33	6	0.07	**0.09**	46.1	233	0.04	0.22
American Robin	8	13	5	0.06	**0.07**	48.5	141	0.03	0.17
Varied Thrush	54	85	7	0.08	**0.16**	14.3	199	0.12	0.22
Black-throated Gray Warbler	1	3	3	0.03	**0.03**	100.5	110	0.01	0.16
Townsend's Warbler	41	66	26	0.30	**0.32**	19.0	224	0.22	0.47
Wilson's Warbler	2	2	1	0.01	**0.02**	71.2	110	0.01	0.08
Western Tanager	1	1	0	0.00	**0.01**	101.2	110	<0.01	0.04
Spotted Towhee	1	1	0	0.00	--				
Song Sparrow	1	1	1	0.01	**0.01**	102.6	110	<0.01	0.06

Table 9. Results from 111 point counts at locations classified as Mixed Douglas-fir/Western Hemlock. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

					Adjusted Density[6]				
Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	**Estimate (birds/ha)**	CV	df	Lower 95% C.I.	Upper 95% C.I.
Dark-eyed Junco	19	26	13	0.15	**0.25**	25	145	0.15	0.41
Red-winged Blackbird	1	1	0	0.00	**0.01**	102.6	110	<0.01	0.06
Red Crossbill	9	15	10	0.11	**0.25**	41.2	110	0.11	0.54
Pine Siskin	12	18	12	0.14	**0.15**	37.1	138	0.07	0.30
Evening Grosbeak	3	7	1	0.01	**0.06**	63.7	110	0.02	0.20

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 10. Results from 112 point counts at locations classified as Douglas-fir. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Canada Goose	0	0	0	0.00	--				
Blue Grouse	1	1	0	0.00	**<0.01**	101.0	111	<0.01	0.02
Band-tailed Pigeon	1	1	0	0.00	**<0.01**	101.0	111	<0.01	0.02
Vaux's Swift	3	3	1	0.01	--				
Rufous Hummingbird	1	1	1	0.01	**0.11**	102.3	111	0.02	0.59
Red-breasted Sapsucker	1	1	1	0.01	--				
Hairy Woodpecker	5	5	5	0.06	**0.06**	45.3	111	0.03	0.14
Northern Flicker	4	4	0	0.00	**0.01**	63.1	111	<0.01	0.04
Pileated Woodpecker	4	4	1	0.01	**0.01**	50.5	111	<0.01	0.03
Hammond's Flycatcher	26	32	27	0.31	**0.56**	25.6	196	0.34	0.92
Pacific-slope Flycatcher	23	27	16	0.18	**0.31**	22.7	159	<0.01	0.49
Warbling Vireo	8	8	3	0.03	**0.03**	50.2	111	0.01	0.09
Gray Jay	3	4	2	0.02	**0.06**	64.8	138	0.02	0.20
Steller's Jay	5	5	0	0.00	**0.02**	45.5	111	0.01	0.05
American Crow	1	1	0	0.00	--				
Common Raven	6	7	0	0.00	**0.01**	48.1	111	0.00	0.02
Barn Swallow	1	4	4	0.05	--				
Chestnut-backed Chickadee	55	85	82	0.93	**2.17**	20.5	520	1.46	3.23
Red-breasted Nuthatch	18	19	3	0.03	**0.07**	61.1	207	0.02	0.2
Brown Creeper	13	13	11	0.13	**0.23**	33.1	165	0.12	0.43
Canyon Wren	1	1	0	0.00	--				
Winter Wren	60	77	28	0.32	**0.50**	12.6	170	0.39	0.64
Golden-crowned Kinglet	25	28	26	0.30	**0.82**	21.9	134	0.53	1.25
Swainson's Thrush	10	11	1	0.01	**0.03**	40.5	161	0.02	0.07
Hermit Thrush	33	43	15	0.17	**0.12**	44.9	217	0.05	0.27
American Robin	9	9	4	0.05	**0.03**	44	147	0.02	0.08
Varied Thrush	41	53	10	0.11	**0.11**	16.2	174	0.08	0.14
Yellow-rumped Warbler	1	1	1	0.01	**0.01**	101.6	111	<0.01	0.04
Black-throated Gray Warbler	5	7	3	0.03	**0.06**	47.4	111	0.02	0.14
Townsend's Warbler	64	105	52	0.59	**0.56**	15.2	314	0.42	0.76

Table 10. Results from 112 point counts at locations classified as Douglas-fir. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
MacGillivray's Warbler	1	1	1	0.01	**0.01**	104.3	111	<0.01	0.06
Common Yellowthroat	1	1	1	0.01	**--**				
Wilson's Warbler	2	2	0	0.00	**0.02**	71.2	111	0.01	0.08
Western Tanager	4	6	0	0.00	**0.04**	54.3	111	0.02	0.12
Song Sparrow	3	5	2	0.02	**0.05**	63.9	111	0.02	0.17
White-crowned Sparrow	2	2	1	0.01	**--**				
Dark-eyed Junco	29	43	27	0.31	**0.43**	21.8	160	0.28	0.66
Red-winged Blackbird	2	4	1	0.01	**0.04**	82.2	111	0.01	0.18
Brown-headed Cowbird	1	1	0	0.00	**--**				
Red Crossbill	3	3	3	0.03	**0.05**	59.1	111	0.02	0.14
Pine Siskin	7	11	8	0.09	**0.07**	46.8	128	0.03	0.18
Evening Grosbeak	1	1	1	0.01	**0.01**	101.2	111	<0.01	0.05

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 11. Results from 42 point counts at locations classified as Mid-elevation Shrub. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Blue Grouse	1	1	0	0.00	**0.02**	100.8	41	<0.01	0.08
Vaux's Swift	4	11	5	0.15	**--**				
Rufous Hummingbird	11	16	16	0.49	**--**				
Northern Flicker	1	1	0	0.00	**0.01**	105.9	41	<0.01	0.04
Olive-sided Flycatcher	3	3	1	0.03	**0.02**	57.2	41	0.01	0.05
Western Wood-Pewee	1	1	1	0.03	**--**				
Hammond's Flycatcher	4	5	3	0.09	**0.10**	52.9	41	0.04	0.26
Pacific-slope Flycatcher	18	23	16	0.49	**0.53**	29.5	41	0.30	0.96
Warbling Vireo	13	18	13	0.39	**0.24**	29.8	41	0.13	0.43
Steller's Jay	7	8	4	0.12	**0.04**	58.6	41	0.01	0.11
Common Raven	1	1	0	0.00	**0.00**				
Tree Swallow	1	1	1	0.03	**--**				
Chestnut-backed Chickadee	11	15	13	0.39	**0.98**	33.7	62	0.51	1.89
Red-breasted Nuthatch	4	4	0	0.00	**0.05**	61.4	100	0.02	0.17
Brown Creeper	5	5	4	0.12	**0.13**	101.3	41	0.03	0.73
Winter Wren	15	20	9	0.27	**0.48**	37.0	123	0.24	0.98
Golden-crowned Kinglet	4	4	3	0.09	**0.40**	58.6	48	0.14	1.20
Ruby-crowned Kinglet	1	1	1	0.03	**0.02**	101.1	41	<0.01	0.12
Swainson's Thrush	11	15	4	0.12	**0.07**	53.6	41	0.02	0.19
Hermit Thrush	6	7	2	0.06	**0.03**	61.0	131	0.01	0.10
American Robin	4	5	3	0.09	**0.07**	53.6	49	0.03	0.19
Varied Thrush	25	34	5	0.15	**0.21**	17.8	48	0.15	0.30
Yellow Warbler	4	5	5	0.15	**0.11**	53.3	41	0.04	0.31
Black-throated Gray Warbler	1	2	1	0.03	**0.02**	101.1	41	<0.01	0.12
Townsend's Warbler	14	17	6	0.18	**0.35**	29.2	41	0.20	0.62
MacGillivray's Warbler	7	7	7	0.21	**0.15**	37.9	41	0.07	0.32
Wilson's Warbler	10	10	6	0.18	**0.22**	31.6	41	0.12	0.42
Western Tanager	1	1	0	0.00	**0.01**	101.2	41	<0.01	0.08
Spotted Towhee	1	1	1	0.03	**--**				
Chipping Sparrow	1	1	1	0.03	**0.02**	102.5	41	<0.01	0.11

Table 11. Results from 42 point counts at locations classified as Mid-elevation Shrub. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6] **Estimate (birds/ha)**	CV	df	Lower 95% C.I.	Upper 95% C.I.
Song Sparrow	1	1	0	0.00	**0.01**	103.2	41	<0.01	0.07
Dark-eyed Junco	14	15	10	0.30	**0.67**	27.4	52	0.39	1.15
Black-headed Grosbeak	2	2	2	0.06	**--**				
Red Crossbill	3	3	2	0.06	**0.07**	58.4	41	0.02	0.20
Pine Siskin	3	3	1	0.03	**0.05**	63.8	66	0.01	0.15

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 12. Results from 15 point counts at locations classified as Noble Fir.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Hairy Woodpecker	1	1	1	0.08	**0.09**	100.6	14	0.01	0.54
Pileated Woodpecker	1	1	0	0.00	**0.00**				
Pacific-slope Flycatcher	1	1	1	0.08	**0.10**	100.5	14	0.02	0.61
Gray Jay	6	6	3	0.25	**0.46**	49.8	22	0.17	1.22
Steller's Jay	1	1	0	0.00	**0.03**	100.7	14	0.01	0.20
Common Raven	1	1	0	0.00	**0.01**	100.8	14	<0.01	0.07
Chestnut-backed Chickadee	9	15	15	1.27	**3.00**	30.7	28	1.62	5.55
Red-breasted Nuthatch	7	7	1	0.08	**0.19**	63.4	144	0.06	0.59
Brown Creeper	3	3	3	0.25	**0.47**	55.9	17	0.16	1.40
Winter Wren	11	16	8	0.68	**0.81**	22.5	16	0.50	1.29
Golden-crowned Kinglet	4	7	7	0.59	**1.78**	46.6	15	0.69	4.58
Hermit Thrush	2	4	2	0.17	**0.07**	83.6	25	0.02	0.29
Varied Thrush	12	20	5	0.42	**0.33**	20.3	19	0.22	0.50
Townsend's Warbler	2	3	0	0.00	**0.13**	73.2	15	0.03	0.53
Dark-eyed Junco	7	8	4	0.34	**0.65**	32.3	17	0.33	1.26
Red Crossbill	3	3	1	0.08	**0.24**	69.7	14	0.06	0.93
Pine Siskin	7	10	2	0.17	**0.61**	37.0	18	0.29	1.30

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details.

Table 13. Results from 136 point counts at locations classified as Pacific Silver Fir. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Canada Goose	0	0	0	0.00	--				
Blue Grouse	3	3	0	0.00	**0.01**	59.1	135	<0.01	0.02
Band-tailed Pigeon	3	3	2	0.02	**0.01**	59.1	135	<0.01	0.02
Barred Owl	1	1	0	0.00	--				
Vaux's Swift	8	13	11	0.10	--				
Rufous Hummingbird	2	2	2	0.02	--				
Belted Kingfisher	1	1	0	0.00	--				
Hairy Woodpecker	10	11	8	0.07	**0.10**	35.5	135	0.05	0.19
Northern Flicker	6	6	3	0.03	**0.01**	59.1	135	<0.01	0.04
Pileated Woodpecker	2	2	0	0.00	**<0.01**	100.6	135	<0.01	0.01
Hammond's Flycatcher	13	14	14	0.13	**0.21**	31.3	203	0.12	0.39
Pacific-slope Flycatcher	18	23	18	0.17	**0.26**	25.4	180	0.16	0.42
Gray Jay	20	29	21	0.20	**0.37**	33.1	163	0.19	0.69
Steller's Jay	2	2	0	0.00	**0.01**	71.5	135	<0.01	0.03
Clark's Nutcracker	1	1	0	0.00	**<0.01**	101.7	135	<0.01	0.02
Common Raven	5	5	0	0.00	**0.01**	51.0	135	<0.01	0.01
Mountain Chickadee	1	2	2	0.02	**0.01**	101.7	135	<0.01	0.05
Chestnut-backed Chickadee	68	110	105	0.98	**2.32**	19.8	606	1.58	3.40
Red-breasted Nuthatch	49	67	27	0.25	**0.17**	58.4	178	0.06	0.50
Brown Creeper	15	17	15	0.14	**0.26**	32.3	196	0.14	0.48
Winter Wren	82	114	62	0.58	**0.65**	10.0	271	0.53	0.79
Golden-crowned Kinglet	48	67	65	0.61	**1.74**	16.5	186	1.26	2.40
Swainson's Thrush	3	4	0	0.00	**0.01**	77.4	156	<0.01	0.04
Hermit Thrush	42	57	9	0.08	**0.12**	44.2	207	0.05	0.28
American Robin	10	10	7	0.07	**0.04**	37.3	180	0.02	0.09
Varied Thrush	82	140	18	0.17	**0.24**	11.7	327	0.19	0.30
Yellow-rumped Warbler	3	3	1	0.01	**0.02**	60.1	135	0.01	0.06
Townsend's Warbler	14	15	8	0.07	**0.06**	30.7	176	0.04	0.11
Wilson's Warbler	1	1	1	0.01	**0.01**	100.6	135	<0.01	0.05
Western Tanager	1	1	1	0.01	**0.01**	101.2	135	<0.01	0.03

Table 13. Results from 136 point counts at locations classified as Pacific Silver Fir. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

					Adjusted Density[6]				
Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	**Estimate (birds/ha)**	CV	df	Lower 95% C.I.	Upper 95% C.I.
Chipping Sparrow	1	2	1	0.01	**0.01**	100.7	135	<0.01	0.06
Song Sparrow	1	2	2	0.02	**0.02**	102.6	135	<0.01	0.10
Dark-eyed Junco	48	64	34	0.32	**0.51**	16.7	245	0.37	0.70
Pine Grosbeak	2	2	1	0.01	--				
Red Crossbill	8	10	4	0.04	**0.11**	41.4	135	0.05	0.23
Pine Siskin	41	60	33	0.31	**0.38**	20.1	244	0.26	0.56
Evening Grosbeak	8	9	5	0.05	**0.07**	39.1	135	0.03	0.14

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 14. Results from 7 point counts at locations classified as Engelmann Spruce. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Rufous Hummingbird	1	1	1	0.18	**--**				
Chestnut-backed Chickadee	3	4	4	0.73	**1.71**	54.6	7	0.52	5.68
Red-breasted Nuthatch	4	4	1	0.18	**0.23**	66.7	61	0.07	0.77
Winter Wren	3	3	3	0.55	**0.35**	47.5	6	0.12	1.03
American Dipper	1	1	1	0.18	**--**				
Golden-crowned Kinglet	3	3	3	0.55	**1.63**	47.6	6	0.55	4.88
Hermit Thrush	6	8	2	0.36	**0.24**	49.1	63	0.09	0.59
Varied Thrush	3	6	2	0.36	**0.18**	66.7	6	0.04	0.77
Wilson's Warbler	1	1	1	0.18	**0.19**	100.6	6	0.02	1.44
Dark-eyed Junco	2	5	3	0.55	**0.87**	67.0	6	0.20	3.79
Pine Siskin	3	4	2	0.36	**0.53**	53.5	7	0.16	1.74

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details.

Table 15. Results from 6 point counts at locations classified as Alaska Yellow Cedar.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Chestnut-backed Chickadee	1	1	1	0.21	**0.53**	101.2	5	0.06	4.43
Golden-crowned Kinglet	2	4	3	0.64	**2.82**	101.3	5	0.34	23.67
Ruby-crowned Kinglet	1	1	2	0.00	**0.15**	101.1	5	0.02	1.32
Hermit Thrush	2	2	0	0.00	**0.06**	78.0	11	0.01	0.29
Varied Thrush	2	2	0	0.00	**0.09**	63.4	5	0.02	0.39
Dark-eyed Junco	2	4	2	0.42	**1.44**	63.9	5	0.33	6.36

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details.

Table 16. Results from 30 point counts at locations classified as High-elevation Shrub. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Blue Grouse	1	1	0	0.00	**0.02**	100.8	29	<0.01	0.12
Spotted Sandpiper	1	1	0	0.00	**0.00**				
Rufous Hummingbird	1	1	1	0.04	**--**				
Northern Flicker	1	1	0	0.00	**0.01**	105.9	29	<0.01	0.06
Olive-sided Flycatcher	2	4	0	0.00	**0.03**	78.9	29	0.01	0.14
Pacific-slope Flycatcher	2	2	1	0.04	**0.07**	72.8	29	0.02	0.26
Warbling Vireo	2	2	1	0.04	**0.04**	71.2	29	0.01	0.15
Gray Jay	4	4	1	0.04	**0.10**	49.7	29	0.04	0.25
Steller's Jay	2	2	0	0.00	**0.01**	83.1	29	<0.01	0.06
Common Raven	2	2	0	0.00	**0.01**	83.1	29	<0.01	0.06
Chestnut-backed Chickadee	10	14	14	0.59	**1.48**	33.9	44	0.76	2.87
Red-breasted Nuthatch	8	15	10	0.42	**0.29**	66.1	63	0.09	0.95
Winter Wren	12	14	10	0.42	**0.56**	37.4	99	0.27	1.14
Golden-crowned Kinglet	3	3	3	0.13	**0.56**	58.0	34	0.19	1.69
Ruby-crowned Kinglet	1	1	0	0.00	**0.00**				
Swainson's Thrush	1	1	0	0.00	**0.01**	109.9	29	<0.01	0.04
Hermit Thrush	17	23	2	0.08	**0.15**	49.6	134	0.06	0.37
American Robin	3	3	0	0.00	**0.04**	71.2	32	0.01	0.15
Varied Thrush	12	21	5	0.21	**0.18**	27.7	31	0.10	0.31
Yellow Warbler	2	2	1	0.04	**0.06**	71.1	29	0.02	0.23
Townsend's Warbler	1	4	1	0.04	**0.12**	101.1	29	0.02	0.68
Wilson's Warbler	7	8	7	0.30	**0.25**	38.6	29	0.12	0.54
Western Tanager	1	1	0	0.00	**0.02**	101.2	29	<0.01	0.11
Fox Sparrow	4	4	1	0.04	**0.07**	53.8	29	0.03	0.20
Dark-eyed Junco	14	26	18	0.76	**1.73**	26.6	37	1.02	2.94
Cassin's Finch	1	1	1	0.04	**--**				

Table 16. Results from 30 point counts at locations classified as High-elevation Shrub. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6] **Estimate (birds/ha)**	CV	df	Lower 95% C.I.	Upper 95% C.I.
Pine Siskin	10	20	10	0.42	**0.41**	44.3	89	0.18	0.94
Evening Grosbeak	2	2	0	0.00	**0.06**	71.1	29	0.02	0.23

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 17. Results from 30 point counts at locations classified as Mountain Hemlock. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Vaux's Swift	1	1	0	0.00	**--**				
Rufous Hummingbird	1	1	1	0.04	**--**				
Pileated Woodpecker	2	2	0	0.00	**0.02**	77.8	29	<0.01	0.08
Pacific-slope Flycatcher	1	1	1	0.04	**0.03**	102.4	29	0.01	0.19
Gray Jay	3	3	1	0.04	**0.07**	57.8	29	0.02	0.22
Common Raven	2	2	0	0.00	**0.00**				
Mountain Chickadee	2	4	2	0.08	**0.12**	74.6	29	0.03	0.48
Chestnut-backed Chickadee	15	19	15	0.64	**1.58**	29.2	52	0.89	2.81
Red-breasted Nuthatch	16	25	8	0.34	**0.44**	45.0	177	0.19	1.02
Brown Creeper	2	2	2	0.08	**0.38**	71.3	29	0.10	1.40
Winter Wren	8	8	1	0.04	**0.24**	46.6	65	0.10	0.58
Golden-crowned Kinglet	8	10	9	0.38	**1.69**	39.7	41	0.78	3.67
Hermit Thrush	12	19	2	0.08	**0.10**	52.0	137	0.04	0.27
American Robin	2	2	1	0.04	**0.04**	71.2	32	0.01	0.15
Varied Thrush	20	27	5	0.21	**0.19**	22.4	32	0.12	0.29
Townsend's Warbler	1	1	0	0.00	**0.03**	101.1	29	0.01	0.17
Spotted Towhee	1	1	0	0.00	**--**				
Chipping Sparrow	1	1	1	0.04	**0.03**	102.5	29	<0.01	0.16
Dark-eyed Junco	17	27	23	0.98	**1.87**	21.1	44	1.23	2.85
Pine Grosbeak	1	1	0	0.00	**--**				
Red Crossbill	3	4	2	0.08	**0.13**	61.4	29	0.04	0.40
Pine Siskin	14	18	12	0.51	**0.39**	39.8	123	0.18	0.82
Evening Grosbeak	4	4	0	0.00	**0.03**	101.1	29	0.01	0.17

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details.

Table 18. Results from 76 point counts at locations classified as Subalpine Fir. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Sharp-shinned Hawk	0	0	0	0.00	--				
Red-tailed Hawk	1	1	1	0.02	--				
Blue Grouse	3	3	0	0.00	**0.02**	71.3	75	<0.01	0.06
Spotted Sandpiper	1	1	0	0.00	**0.03**	100.4	75	0.01	0.15
Rufous Hummingbird	4	4	4	0.07	--				
Hairy Woodpecker	3	4	0	0.00	**0.02**	72.0	75	<0.01	0.06
Northern Flicker	3	3	1	0.02	**0.01**	66.8	75	<0.01	0.04
Olive-sided Flycatcher	2	3	0	0.00	**0.01**	74.8	75	<0.01	0.04
Dusky Flycatcher	1	1	1	0.02	--				
Warbling Vireo	1	1	1	0.02	**0.01**	101.2	75	<0.01	0.04
Gray Jay	13	13	6	0.10	**0.11**	31.9	75	0.06	0.20
Steller's Jay	1	1	1	0.02	**<0.01**	109.9	75	<0.01	0.01
Clark's Nutcracker	3	4	2	0.03	**0.01**	62.2	75	<0.01	0.05
Common Raven	1	1	0	0.00	**0.00**				
Mountain Chickadee	12	16	11	0.18	**0.23**	35.6	75	0.11	0.45
Chestnut-backed Chickadee	17	25	25	0.42	**1.04**	28.8	124	0.60	1.82
Red-breasted Nuthatch	44	74	34	0.57	**0.53**	40.1	214	0.25	1.13
Brown Creeper	4	4	4	0.07	**0.30**	51.6	75	0.11	0.78
Winter Wren	18	26	11	0.18	**0.39**	36.4	161	0.20	0.79
Golden-crowned Kinglet	12	24	24	0.40	**1.78**	33.9	112	0.93	3.42
Hermit Thrush	24	37	6	0.10	**0.09**	49.9	147	0.03	0.22
American Robin	5	5	3	0.05	**0.04**	46.2	93	0.02	0.09
Varied Thrush	30	55	7	0.12	**0.18**	18.4	86	0.13	0.26
Yellow-rumped Warbler	6	7	5	0.08	**0.09**	44.1	75	0.04	0.20
Townsend's Warbler	10	14	11	0.18	**0.17**	34.9	75	0.09	0.33
Townsend's-Hermit Warbler	1	2	2	0.03	--				
Hermit Warbler	1	1	1	0.02	--				
Chipping Sparrow	7	9	8	0.13	**0.10**	44.7	75	0.04	0.23
Fox Sparrow	5	5	2	0.03	**0.03**	55.3	75	0.01	0.08
Lincoln's Sparrow	1	1	1	0.02	**0.03**	100.4	75	0.01	0.15

Table 18. Results from 76 point counts at locations classified as Subalpine Fir. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Dark-eyed Junco	43	72	52	0.87	**1.96**	16.5	149	1.42	2.71
Red Crossbill	4	4	2	0.03	**0.05**	51.4	75	0.02	0.13
Pine Siskin	28	41	23	0.39	**0.33**	35.1	257	0.17	0.64
Evening Grosbeak	4	4	1	0.02	**0.05**	51.2	75	0.02	0.13

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 19. Results from 104 point counts at locations classified as Heather/Herbaceous Sedge Meadow. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
American Kestrel	1	1	1	0.01	**--**				
Blue Grouse	5	5	2	0.02	**0.02**	50.8	103	0.01	0.06
Spotted Sandpiper	1	1	0	0.00	**0.00**				
Rufous Hummingbird	7	7	7	0.09	**--**				
Hairy Woodpecker	4	4	0	0.00	**0.02**	59.3	103	0.01	0.05
Northern Flicker	10	10	0	0.00	**0.03**	46.2	103	0.01	0.07
Olive-sided Flycatcher	8	10	0	0.00	**0.03**	37.7	103	0.01	0.05
Pacific-slope Flycatcher	1	1	1	0.01	**0.01**	102.4	103	<0.01	0.05
Gray Jay	19	24	6	0.07	**0.15**	29.1	103	0.09	0.27
Steller's Jay	2	2	1	0.01	**<0.01**	83.9	103	<0.01	0.02
Clark's Nutcracker	10	14	1	0.01	**0.04**	36.6	103	0.02	0.08
Common Raven	1	1	0	0.00	**0.00**				
Violet-green Swallow	1	4	4	0.05	**--**				
Mountain Chickadee	21	25	7	0.09	**0.26**	26.3	103	0.16	0.44
Chestnut-backed Chickadee	3	3	1	0.01	**0.03**	101.1	108	0.01	0.16
Red-breasted Nuthatch	46	77	27	0.33	**0.37**	41.4	235	0.17	0.80
Brown Creeper	2	2	2	0.02	**0.11**	72.2	103	0.03	0.39
Winter Wren	20	24	8	0.10	**0.26**	36.5	177	0.13	0.53
American Dipper	1	1	1	0.01	**--**				
Golden-crowned Kinglet	9	13	12	0.15	**0.60**	45.7	130	0.25	1.41
Ruby-crowned Kinglet	2	2	1	0.01	**0.02**	71.9	103	<0.01	0.06
Mountain Bluebird	6	15	10	0.12	**0.07**	81.8	103	0.02	0.31
Townsend's Solitaire	2	3	1	0.01	**--**				
Hermit Thrush	20	28	2	0.02	**0.04**	52.8	173	0.02	0.12
American Robin	29	36	10	0.12	**0.18**	24.9	149	0.11	0.30
Varied Thrush	29	44	8	0.10	**0.10**	20.6	115	0.07	0.15
American Pipit	3	6	4	0.05	**0.06**	64.1	103	0.02	0.19
Cedar Waxwing	1	1	1	0.01	**--**				
Orange-crowned Warbler	1	1	1	0.01	**--**				
Yellow-rumped Warbler	15	20	9	0.11	**0.18**	30.5	103	0.10	0.33

Table 19. Results from 104 point counts at locations classified as Heather/Herbaceous Sedge Meadow. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6] **Estimate (birds/ha)**	CV	df	Lower 95% C.I.	Upper 95% C.I.
Western Tanager	2	2	1	0.01	**0.01**	72.1	103	<0.01	0.04
Chipping Sparrow	19	25	17	0.21	**0.20**	33.8	103	0.10	0.38
Fox Sparrow	14	17	1	0.01	**0.09**	36.9	103	0.04	0.18
Lincoln's Sparrow	4	4	2	0.02	**0.06**	57.9	103	0.02	0.18
Dark-eyed Junco	71	153	94	1.15	**2.76**	14.8	239	2.07	3.69
Black-headed Grosbeak	1	1	1	0.01	**--**				
Gray-crowned Rosy-Finch	2	3	2	0.02	**0.13**	90.8	27	0.03	0.64
Cassin's Finch	2	2	1	0.01	**--**				
Red Crossbill	5	6	1	0.01	**0.05**	54.5	103	0.02	0.13
Pine Siskin	58	101	43	0.53	**0.72**	37.7	334	0.35	1.47
Evening Grosbeak	2	3	0	0.00	**0.03**	75.7	103	0.01	0.10

[1]Includes all species detected during point counts in the habitat.

[2]Number of points where the species was detected, including flyovers.

[3] Number of individual birds detected at any distance during point counts, excluding flyovers.

[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.

[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.

[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for details

Table 20. Results from 52 point counts at locations classified as Rock or Sparsely Vegetated. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red-tailed Hawk	1	1	0	0.00	--				
White-tailed Ptarmigan	1	1	1	0.02	--				
Spotted Sandpiper	3	3	1	0.02	**0.12**	57.3	51	0.04	0.36
Vaux's Swift	1	1	1	0.02	--				
Rufous Hummingbird	4	4	4	0.10	--				
Hairy Woodpecker	2	2	0	0.00	**0.02**	71.7	51	0.01	0.08
Northern Flicker	2	3	1	0.02	**0.02**	81.8	51	<0.01	0.07
Pileated Woodpecker	1	1	0	0.00	**0.00**				
Hammond's Flycatcher	1	1	1	0.02	**0.02**	102.4	51	<0.01	0.11
Pacific-slope Flycatcher	2	3	2	0.05	**0.06**	77.1	51	0.01	0.23
Warbling Vireo	4	6	2	0.05	**0.07**	53.7	51	0.02	0.19
Gray Jay	1	1	1	0.02	**0.01**	101.2	51	<0.01	0.08
Steller's Jay	2	2	0	0.00	**0.01**	83.6	51	<0.01	0.03
Clark's Nutcracker	6	9	0	0.00	**0.02**	61.9	51	0.01	0.07
Common Raven	1	1	0	0.00	**0.00**				
Violet-green Swallow	1	4	4	0.10	--				
Mountain Chickadee	2	4	1	0.02	**0.02**	100.8	51	<0.01	0.13
Chestnut-backed Chickadee	3	3	3	0.07	**0.18**	58.6	58	0.06	0.54
Red-breasted Nuthatch	4	6	0	0.00	**0.03**	68.2	102	0.01	0.11
Canyon Wren	1	1	0	0.00	--				
Winter Wren	8	8	2	0.05	**0.11**	51.4	94	0.04	0.30
American Dipper	1	2	2	0.05	--				
Golden-crowned Kinglet	1	1	1	0.02	**0.11**	101.3	54	0.02	0.58
Mountain Bluebird	6	6	1	0.02	**0.11**	108.9	3	0.01	1.66
Swainson's Thrush	2	2	0	0.00	**0.01**	83.6	51	<0.01	0.03
Hermit Thrush	4	7	1	0.02	**0.02**	84.8	94	<0.01	0.08
American Robin	3	5	3	0.07	**0.05**	80.1	55	0.01	0.19
Varied Thrush	4	6	0	0.00	**0.02**	56.8	52	0.01	0.04
American Pipit	9	10	3	0.07	**0.14**	39.2	51	0.07	0.28
Yellow-rumped Warbler	2	3	0	0.00	**0.05**	75.4	51	0.01	0.21

Table 20. Results from 52 point counts at locations classified as Rock or Sparsely Vegetated. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability (continued).

Species[1]	Points with Detections[2]	Non-flyover Detections[3]	Non-flyover Detections within 50 m[4]	Unadjusted Density (birds/ha)[5]	Adjusted Density[6]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Townsend's Warbler	2	3	0	0.00	**0.05**	75.4	51	0.01	0.20
Wilson's Warbler	2	2	2	0.05	**0.04**	71.6	51	0.01	0.13
Chipping Sparrow	2	2	1	0.02	**0.02**	102.5	51	<0.01	0.09
Song Sparrow	1	1	0	0.00	**0.01**	103.2	51	<0.01	0.06
Dark-eyed Junco	16	20	12	0.29	**0.66**	29.1	63	0.38	1.17
Gray-crowned Rosy-Finch	7	8	2	0.05	**0.05**	57.1	51	0.02	0.14
Red Crossbill	1	2	0	0.00	**0.04**	101.2	51	0.01	0.20
Pine Siskin	15	20	3	0.07	**0.20**	41.7	166	0.09	0.44
Evening Grosbeak	0	0	0	0.00	**0.00**				

[1]Includes all species detected during point counts in the habitat.
[2]Number of points where the species was detected, including flyovers.
[3] Number of individual birds detected at any distance during point counts, excluding flyovers.
[4] Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers.
[5] Based on number of detections within 50 m of the observer, with no adjustment for detectability.
[6] Estimates and statistics calculated using the software Distance 4.0 Release 2 (Thomas et al. 2003). See Methods for detail

Table 21. Habitat-specific density estimates of Blue Grouse at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.5	1	0	0.00	**<0.01**	101.0	189	<0.01	0.01
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.9	1	0	0.00	**0.00**				
Douglas-fir	0.9	1	0	0.00	**<0.01**	101.0	111	<0.01	0.02
Mid-elevation Shrub	2.4	1	0	0.00	**0.02**	100.8	41	<0.01	0.08
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	2.2	3	0	0.00	**0.01**	59.1	135	<0.01	0.02
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	3.3	1	0	0.00	**0.02**	100.8	29	<0.01	0.12
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	3.9	3	0	0.00	**0.02**	71.3	75	<0.01	0.06
Heather/Herbaceous Sedge Meadow	4.8	5	2	0.02	**0.02**	50.8	103	0.01	0.06
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 22. Habitat-specific density estimates of Spotted Sandpiper at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	4.8	1	0	0.00	**0.06**	100.4	20	0.01	0.33
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	3.3	1	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	1.3	1	0	0.00	**0.03**	100.4	75	0.01	0.15
Heather/Herbaceous Sedge Meadow	1.0	1	0	0.00	**0.00**				
Rock or Sparsely Vegetated	5.8	3	1	0.02	**0.12**	57.3	51	0.04	0.36

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 23. Habitat-specific density estimates of Marbled Murrelet at Mount Rainier National Park. An entry of '--' for the Adjusted Density Estimate indicates a habitat for which we did not model detectability.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	2.1	5	0	0.00	**0.01**	70.4	189	<0.01	0.04
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	0.0	0	0	0.00	--				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	--				
High-elevation Shrub	0.0	0	0	0.00	--				
Mountain Hemlock	0.0	0	0	0.00	--				
Subalpine Fir	0.0	0	0	0.00	--				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	--				
Rock or Sparsely Vegetated	0.0	0	0	0.00	--				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 24. Habitat-specific density estimates of Band-tailed Pigeon at Mount Rainier National Park. An entry of '--' for the Adjusted Density Estimate indicates a habitat for which we did not model detectability.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	1.6	4	2	0.01	**0.01**	75.7	189	<0.01	0.02
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	2.7	8	4	0.05	**0.03**	69.6	110	0.01	0.09
Douglas-fir	0.9	1	0	0.00	**<0.01**	101.0	111	<0.01	0.02
Mid-elevation Shrub	0.0	0	0	0.00	--				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	2.2	3	2	0.02	**0.01**	59.1	135	<0.01	0.02
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	--				
High-elevation Shrub	0.0	0	0	0.00	--				
Mountain Hemlock	0.0	0	0	0.00	--				
Subalpine Fir	0.0	0	0	0.00	--				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	--				
Rock or Sparsely Vegetated	0.0	0	0	0.00	--				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 25. Habitat-specific density estimates of Hairy Woodpecker at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	4.8	1	1	0.06	**0.06**	100.6	20	0.01	0.37
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	2.1	4	3	0.02	**0.03**	50.9	189	0.01	0.07
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	3.6	4	4	0.05	**0.05**	50.6	110	0.02	0.12
Douglas-fir	4.5	5	5	0.06	**0.06**	45.3	111	0.03	0.14
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	6.7	1	1	0.08	**0.09**	100.6	14	0.01	0.54
Pacific Silver Fir	7.4	11	8	0.07	**0.10**	35.5	135	0.05	0.19
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	3.9	4	0	0.00	**0.02**	72.0	75	<0.01	0.06
Heather/Herbaceous Sedge Meadow	3.8	4	0	0.00	**0.02**	59.3	103	0.01	0.05
Rock or Sparsely Vegetated	3.8	2	0	0.00	**0.02**	71.7	51	0.01	0.08

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 26. Habitat-specific density estimates of Northern Flicker at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	2.1	4	1	0.01	**0.01**	63.3	189	<0.01	0.03
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	1.8	2	0	0.00	**0.01**	80.7	110	<0.01	0.03
Douglas-fir	3.6	4	0	0.00	**0.01**	63.1	111	<0.01	0.04
Mid-elevation Shrub	2.4	1	0	0.00	**0.01**	105.9	41	<0.01	0.04
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	4.4	6	3	0.03	**0.01**	59.1	135	<0.01	0.04
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	3.3	1	0	0.00	**0.01**	105.9	29	<0.01	0.06
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	3.9	3	1	0.02	**0.01**	66.8	75	<0.01	0.04
Heather/Herbaceous Sedge Meadow	9.6	10	0	0.00	**0.03**	46.2	103	0.01	0.07
Rock or Sparsely Vegetated	3.8	3	1	0.02	**0.02**	81.8	51	<0.01	0.07

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 27. Habitat-specific density estimates of Pileated Woodpecker at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	8.0	2	0	0.00	**0.02**	70.1	24	0.01	0.09
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	2.6	5	2	0.01	**0.01**	45.6	189	<0.01	0.02
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.9	1	0	0.00	**0.00**				
Douglas-fir	3.6	4	1	0.01	**0.01**	50.5	111	<0.01	0.03
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	6.7	1	0	0.00	**0.00**				
Pacific Silver Fir	1.5	2	0	0.00	**<0.01**	100.6	135	<0.01	0.01
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	6.7	1	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	1.9	1	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 28. Habitat-specific density estimates of Olive-sided Flycatcher at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.9	1	0	0.00	**<0.01**	106.0	110	<0.01	0.03
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	7.1	3	1	0.03	**0.02**	57.2	41	0.01	0.05
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	4	0	0.00	**0.03**	78.9	29	0.01	0.14
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	2.6	3	0	0.00	**0.01**	74.8	75	<0.01	0.04
Heather/Herbaceous Sedge Meadow	7.7	10	0	0.00	**0.03**	37.7	103	0.01	0.05
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 29. Habitat-specific density estimates of Hammond's Flycatcher at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	42.9	12	11	0.67	**1.09**	32.1	33	0.58	2.06
Conifer Deciduous Mix	32.0	10	9	0.46	**0.75**	38.5	33	0.35	1.59
Grand Fir	20.0	2	0	0.00	**0.42**	101.2	4	0.04	4.10
Western Hemlock	10.5	22	19	0.13	**0.22**	28.8	279	0.13	0.38
Western Redcedar	14.3	1	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	9.0	13	9	0.10	**0.19**	41.9	142	0.09	0.41
Douglas-fir	23.2	32	27	0.31	**0.56**	25.6	196	0.34	0.92
Mid-elevation Shrub	9.5	5	3	0.09	**0.10**	52.9	41	0.04	0.26
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	9.6	14	14	0.13	**0.21**	31.3	203	0.12	0.39
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	1.9	1	1	0.02	**0.02**	102.4	51	<0.01	0.11

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 30. Habitat-specific density estimates of Pacific-slope Flycatcher at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	23.8	6	4	0.24	**0.44**	43.9	22	0.18	1.04
Conifer Deciduous Mix	60.0	22	19	0.97	**1.34**	22.2	36	0.86	2.10
Grand Fir	40.0	5	3	0.76	**1.22**	62	4	0.26	5.77
Western Hemlock	25.3	69	43	0.29	**0.47**	17.9	315	0.33	0.66
Western Redcedar	71.4	6	3	0.55	**1.09**	41.1	7	0.42	2.80
Mixed Douglas-fir/Western Hemlock	17.1	27	17	0.20	**0.36**	26.2	144	0.22	0.60
Douglas-fir	20.5	27	16	0.18	**0.31**	22.7	159	0.20	0.49
Mid-elevation Shrub	42.9	23	16	0.49	**0.53**	29.5	41	0.30	0.96
Noble Fir	6.7	1	1	0.08	**0.10**	100.5	14	0.02	0.61
Pacific Silver Fir	13.2	23	18	0.17	**0.26**	25.4	180	0.16	0.42
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	2	1	0.04	**0.07**	72.8	29	0.02	0.26
Mountain Hemlock	3.3	1	1	0.04	**0.03**	102.4	29	0.01	0.19
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	1.0	1	1	0.01	**0.01**	102.4	103	<0.01	0.05
Rock or Sparsely Vegetated	3.8	3	2	0.05	**0.06**	77.1	51	0.01	0.23

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 31. Habitat-specific density estimates of Warbling Vireo at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	33.3	9	3	0.18	**0.36**	35.0	20	0.18	0.73
Conifer Deciduous Mix	32.0	10	4	0.20	**0.38**	33.6	24	0.19	0.74
Grand Fir	40.0	2	0	0.00	**0.38**	61.9	4	0.08	1.83
Western Hemlock	2.1	5	1	0.01	**0.02**	61.7	189	0.01	0.06
Western Redcedar	28.6	2	1	0.18	**0.27**	65.2	6	0.06	1.15
Mixed Douglas-fir/Western Hemlock	1.8	2	0	0.00	**0.02**	71.0	110	<0.01	0.06
Douglas-fir	7.1	8	3	0.03	**0.03**	50.2	111	0.01	0.09
Mid-elevation Shrub	31.0	18	13	0.39	**0.24**	29.8	41	0.13	0.43
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	2	1	0.04	**0.04**	71.2	29	0.01	0.15
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	1.3	1	1	0.02	**0.01**	101.2	75	<0.01	0.04
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	7.7	6	2	0.05	**0.07**	53.7	51	0.02	0.19

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 32. Habitat-specific density estimates of Gray Jay at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	20.0	1	1	0.25	**0.34**	102.5	4	0.04	3.32
Western Hemlock	6.3	16	8	0.05	**0.12**	41.3	235	0.05	0.26
Western Redcedar	14.3	1	0	0.00	**0.25**	102.5	7	0.03	1.87
Mixed Douglas-fir/Western Hemlock	4.5	5	3	0.03	**0.08**	49.4	154	0.03	0.2
Douglas-fir	2.7	4	2	0.02	**0.06**	64.8	138	0.02	0.2
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	40.0	6	3	0.25	**0.46**	49.8	22	0.17	1.22
Pacific Silver Fir	14.7	29	21	0.20	**0.37**	33.1	163	0.19	0.69
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	13.3	4	1	0.04	**0.10**	49.7	29	0.04	0.25
Mountain Hemlock	10.0	3	1	0.04	**0.07**	57.8	29	0.02	0.22
Subalpine Fir	17.1	13	6	0.10	**0.11**	31.9	75	0.06	0.20
Heather/Herbaceous Sedge Meadow	18.3	24	6	0.07	**0.15**	29.1	103	0.09	0.27
Rock or Sparsely Vegetated	1.9	1	1	0.02	**0.01**	101.2	51	<0.01	0.08

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 33. Habitat-specific density estimates of Steller's Jay at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	14.3	3	1	0.06	**0.07**	56.1	20	0.02	0.21
Conifer Deciduous Mix	24.0	6	2	0.10	**0.12**	38.3	24	0.05	0.25
Grand Fir	20.0	1	1	0.25	**0.10**	100.7	4	0.01	1.00
Western Hemlock	5.3	10	1	0.01	**0.03**	33.1	189	0.01	0.05
Western Redcedar	28.6	3	2	0.36	**0.21**	70.4	6	0.04	0.99
Mixed Douglas-fir/Western Hemlock	2.7	3	1	0.01	**0.01**	58.5	110	<0.01	0.04
Douglas-fir	4.5	5	0	0.00	**0.02**	45.5	111	0.01	0.05
Mid-elevation Shrub	16.7	8	4	0.12	**0.04**	58.6	41	0.01	0.11
Noble Fir	6.7	1	0	0.00	**0.03**	100.7	14	0.01	0.20
Pacific Silver Fir	1.5	2	0	0.00	**0.01**	71.5	135	<0.01	0.03
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	2	0	0.00	**0.01**	83.1	29	<0.01	0.06
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	1.3	1	1	0.02	**<0.01**	109.9	75	<0.01	0.01
Heather/Herbaceous Sedge Meadow	1.9	2	1	0.01	**<0.01**	83.9	103	<0.01	0.02
Rock or Sparsely Vegetated	3.8	2	0	0.00	**0.01**	83.6	51	<0.01	0.03

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 34. Habitat-specific density estimates of Clark's Nutcracker at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.7	1	0	0.00	**<0.01**	101.7	135	<0.01	0.02
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	3.9	4	2	0.03	**0.01**	62.2	75	<0.01	0.05
Heather/Herbaceous Sedge Meadow	9.6	14	1	0.01	**0.04**	36.6	103	0.02	0.08
Rock or Sparsely Vegetated	11.5	9	0	0.00	**0.02**	61.9	51	0.01	0.07

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 35. Habitat-specific density estimates of Common Raven at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	14.3	3	0	0.00	**0.02**	70.1	20	<0.01	0.06
Conifer Deciduous Mix	8.0	2	0	0.00	**0.01**	70.4	24	<0.01	0.05
Grand Fir	20.0	1	0	0.00	**0.03**	100.8	4	<0.01	0.35
Western Hemlock	3.7	10	3	0.02	**0.01**	48.0	189	<0.01	0.02
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	1.8	2	0	0.00	**<0.01**	71.5	110	<0.01	0.01
Douglas-fir	5.4	7	0	0.00	**0.01**	48.1	111	<0.01	0.02
Mid-elevation Shrub	2.4	1	0	0.00	**0.00**				
Noble Fir	6.7	1	0	0.00	**0.01**	100.8	14	<0.01	0.07
Pacific Silver Fir	3.7	5	0	0.00	**0.01**	51.0	135	<0.01	0.01
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	2	0	0.00	**0.01**	83.1	29	<0.01	0.06
Mountain Hemlock	6.7	2	0	0.00	**0.00**				
Subalpine Fir	1.3	1	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	1.0	1	0	0.00	**0.00**				
Rock or Sparsely Vegetated	1.9	1	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 36. Habitat-specific density estimates of Mountain Chickadee at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.7	2	2	0.02	**0.01**	101.7	135	<0.01	0.05
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	6.7	4	2	0.08	**0.12**	74.6	29	0.03	0.48
Subalpine Fir	15.8	16	11	0.18	**0.23**	35.6	75	0.11	0.45
Heather/Herbaceous Sedge Meadow	20.2	25	7	0.09	**0.26**	26.3	103	0.16	0.44
Rock or Sparsely Vegetated	3.8	4	1	0.02	**0.02**	100.8	51	<0.01	0.13

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 37. Habitat-specific density estimates of Chestnut-backed Chickadee at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	47.6	15	15	0.91	**2.14**	30.7	40	1.17	3.93
Conifer Deciduous Mix	64.0	31	30	1.53	**3.60**	25.9	68	2.17	5.98
Grand Fir	80.0	5	3	0.76	**1.80**	68.7	5	0.35	9.38
Western Hemlock	57.9	168	145	0.97	**2.27**	18.8	671	1.58	3.28
Western Redcedar	57.1	6	5	0.91	**2.14**	53.0	7	0.67	6.86
Mixed Douglas-fir/Western Hemlock	57.7	110	94	1.08	**2.54**	20.1	542	1.72	3.75
Douglas-fir	49.1	85	82	0.93	**2.17**	20.5	520	1.46	3.23
Mid-elevation Shrub	26.2	15	13	0.39	**0.98**	33.7	62	0.51	1.89
Noble Fir	60.0	15	15	1.27	**3.00**	30.7	28	1.62	5.55
Pacific Silver Fir	50.0	110	105	0.98	**2.32**	19.8	606	1.58	3.40
Engelmann Spruce	42.9	4	4	0.73	**1.71**	54.6	7	0.52	5.68
Alaska Yellow Cedar	16.7	1	1	0.21	**0.53**	101.1	5	0.06	4.43
High-elevation Shrub	33.3	14	14	0.59	**1.48**	33.9	44	0.76	2.87
Mountain Hemlock	50.0	19	15	0.64	**1.58**	29.2	52	0.89	2.81
Subalpine Fir	22.4	25	25	0.42	**1.04**	28.8	125	0.60	1.82
Heather/Herbaceous Sedge Meadow	2.9	3	1	0.01	**0.03**	101.1	108	0.01	0.16
Rock or Sparsely Vegetated	5.8	3	3	0.07	**0.18**	58.6	58	0.06	0.54

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 38. Habitat-specific density estimates of Red-breasted Nuthatch at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	20.0	6	0	0.00	**0.08**	75.5	100	0.02	0.31
Grand Fir	20.0	1	0	0.00	**0.08**	114.9	7	0.01	0.71
Western Hemlock	15.8	36	8	0.05	**0.07**	59.8	194	0.03	0.22
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	30.6	38	6	0.07	**0.12**	58.8	182	0.04	0.35
Douglas-fir	16.1	19	3	0.03	**0.07**	61.1	207	0.02	0.20
Mid-elevation Shrub	9.5	4	0	0.00	**0.05**	61.4	100	0.02	0.17
Noble Fir	46.7	7	1	0.08	**0.19**	63.4	144	0.06	0.59
Pacific Silver Fir	36.0	67	27	0.25	**0.17**	58.4	178	0.06	0.50
Engelmann Spruce	57.1	4	1	0.18	**0.23**	66.7	61	0.07	0.77
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	26.7	15	10	0.42	**0.29**	66.1	63	0.09	0.95
Mountain Hemlock	53.3	25	8	0.34	**0.44**	45.0	177	0.19	1.02
Subalpine Fir	57.9	74	34	0.57	**0.53**	40.1	214	0.25	1.13
Heather/Herbaceous Sedge Meadow	44.2	77	27	0.33	**0.37**	41.4	235	0.17	0.80
Rock or Sparsely Vegetated	7.7	6	0	0.00	**0.03**	68.2	102	0.01	0.11

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 39. Habitat-specific density estimates of Brown Creeper at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	14.3	4	4	0.24	**0.44**	60.9	23	0.14	1.42
Conifer Deciduous Mix	4.0	1	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	9.5	19	17	0.11	**0.22**	28.9	248	0.13	0.39
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	12.6	16	14	0.16	**0.31**	30.7	170	0.17	0.57
Douglas-fir	11.6	13	11	0.13	**0.23**	33.1	165	0.12	0.43
Mid-elevation Shrub	11.9	5	4	0.12	**0.13**	101.3	41	0.02	0.73
Noble Fir	20.0	3	3	0.25	**0.47**	55.9	17	0.16	1.40
Pacific Silver Fir	11.0	17	15	0.14	**0.26**	32.3	196	0.14	0.48
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	6.7	2	2	0.08	**0.38**	71.3	29	0.10	1.40
Subalpine Fir	5.3	4	4	0.07	**0.30**	51.6	75	0.11	0.78
Heather/Herbaceous Sedge Meadow	1.9	2	2	0.02	**0.11**	72.2	103	0.03	0.39
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 40. Habitat-specific density estimates of Winter Wren at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	42.9	12	2	0.12	**0.46**	31.5	21	0.24	0.87
Conifer Deciduous Mix	56.0	20	11	0.56	**0.58**	22.7	27	0.37	0.92
Grand Fir	20.0	1	0	0.00	**0.16**	100.2	4	0.02	1.62
Western Hemlock	68.9	197	90	0.60	**0.74**	8.5	479	0.63	0.87
Western Redcedar	42.9	4	0	0.00	**0.23**	64.8	6	0.05	0.98
Mixed Douglas-fir/Western Hemlock	55.0	94	42	0.48	**0.60**	12.2	175	0.47	0.76
Douglas-fir	53.6	77	28	0.32	**0.50**	12.6	170	0.39	0.64
Mid-elevation Shrub	35.7	20	9	0.27	**0.48**	37.0	123	0.24	0.98
Noble Fir	73.3	16	8	0.68	**0.81**	22.5	16	0.50	1.29
Pacific Silver Fir	60.3	114	62	0.58	**0.65**	10.0	271	0.53	0.79
Engelmann Spruce	42.9	3	3	0.55	**0.35**	47.5	6	0.12	1.03
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	40.0	14	10	0.42	**0.56**	37.4	99	0.27	1.14
Mountain Hemlock	26.7	8	1	0.04	**0.24**	46.6	65	0.10	0.58
Subalpine Fir	23.7	26	11	0.18	**0.39**	36.4	161	0.20	0.79
Heather/Herbaceous Sedge Meadow	19.2	24	8	0.10	**0.26**	36.5	177	0.13	0.53
Rock or Sparsely Vegetated	15.4	8	2	0.05	**0.11**	51.4	94	0.04	0.30

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 41. Habitat-specific density estimates of Golden-crowned Kinglet at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	23.8	5	5	0.30	**0.91**	40.5	21	0.4	2.04
Conifer Deciduous Mix	16.0	4	2	0.10	**0.15**	100.2	24	0.03	0.85
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	23.2	51	50	0.34	**0.94**	17.7	248	0.67	1.33
Western Redcedar	14.3	1	1	0.18	**0.54**	100.2	6	0.07	4.17
Mixed Douglas-fir/Western Hemlock	18.9	25	24	0.28	**0.76**	24.9	127	0.47	1.23
Douglas-fir	22.3	28	26	0.30	**0.82**	21.9	134	0.53	1.25
Mid-elevation Shrub	9.5	4	3	0.09	**0.40**	58.6	48	0.14	1.20
Noble Fir	26.7	7	7	0.59	**1.78**	46.6	15	0.69	4.58
Pacific Silver Fir	35.3	67	65	0.61	**1.74**	16.5	186	1.26	2.40
Engelmann Spruce	42.9	3	3	0.55	**1.63**	47.6	6	0.55	4.88
Alaska Yellow Cedar	33.3	4	3	0.64	**2.82**	101.3	5	0.34	23.67
High-elevation Shrub	10.0	3	3	0.13	**0.56**	58.0	34	0.19	1.69
Mountain Hemlock	26.7	10	9	0.38	**1.69**	39.7	41	0.78	3.67
Subalpine Fir	15.8	24	24	0.40	**1.78**	33.9	112	0.93	3.42
Heather/Herbaceous Sedge Meadow	8.7	13	12	0.15	**0.60**	45.7	130	0.25	1.41
Rock or Sparsely Vegetated	1.9	1	1	0.02	**0.11**	101.3	54	0.02	0.58

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 42. Habitat-specific density estimates of Ruby-crowned Kinglet at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.5	1	1	0.01	**<0.01**	100.6	189	<0.01	0.02
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	2.4	1	1	0.03	**0.02**	101.1	41	<0.01	0.12
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	16.7	1	0	0.00	**0.15**	101.1	5	0.02	1.32
High-elevation Shrub	3.3	1	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	1.9	2	1	0.01	**0.02**	71.9	103	<0.01	0.06
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 43. Habitat-specific density estimates of Mountain Bluebird at Mount Rainier National Park. An entry of '--' for the Adjusted Density Estimate indicates a habitat for which we did not model detectability.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	--				
Conifer Deciduous Mix	0.0	0	0	0.00	--				
Grand Fir	0.0	0	0	0.00	--				
Western Hemlock	0.0	0	0	0.00	--				
Western Redcedar	0.0	0	0	0.00	--				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	--				
Douglas-fir	0.0	0	0	0.00	--				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	--				
Pacific Silver Fir	0.0	0	0	0.00	--				
Engelmann Spruce	0.0	0	0	0.00	--				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	5.8	15	10	0.12	**0.07**	81.8	103	0.02	0.31
Heather/Herbaceous Sedge Meadow	11.5	6	1	0.02	**0.11**	108.9	3	0.01	1.66
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 44. Habitat-specific density estimates of Swainson's Thrush at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	38.1	9	5	0.30	**0.20**	37.3	41	0.1	0.41
Conifer Deciduous Mix	36.0	13	6	0.31	**0.20**	38.9	46	0.1	0.43
Grand Fir	20.0	1	0	0.00	**0.09**	102.3	4	0.01	0.89
Western Hemlock	4.7	12	1	0.01	**0.03**	42.5	236	0.01	0.07
Western Redcedar	14.3	1	1	0.18	**0.07**	102.3	7	0.01	0.50
Mixed Douglas-fir/Western Hemlock	3.6	6	0	0.00	**0.03**	56.4	142	0.01	0.07
Douglas-fir	8.9	11	1	0.01	**0.03**	40.5	161	0.02	0.07
Mid-elevation Shrub	26.2	15	4	0.12	**0.07**	53.7	41	0.02	0.19
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	2.2	4	0	0.00	**0.01**	77.4	156	0.00	0.04
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	3.3	1	0	0.00	**0.01**	109.9	29	<0.01	0.04
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	3.8	2	0	0.00	**0.01**	83.6	51	<0.01	0.03

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 45. Habitat-specific density estimates of Hermit Thrush at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	12.0	4	2	0.10	**0.05**	72.3	52	0.01	0.19
Grand Fir	20.0	2	0	0.00	**0.13**	108.4	6	0.02	1.19
Western Hemlock	14.7	38	7	0.05	**0.06**	46.3	242	0.03	0.14
Western Redcedar	14.3	1	1	0.18	**0.05**	108.4	8	0.01	0.35
Mixed Douglas-fir/Western Hemlock	21.6	33	6	0.07	**0.09**	46.1	233	0.04	0.22
Douglas-fir	29.5	43	15	0.17	**0.12**	44.9	217	0.05	0.27
Mid-elevation Shrub	14.3	7	2	0.06	**0.03**	61.0	131	0.01	0.10
Noble Fir	13.3	4	2	0.17	**0.07**	83.6	25	0.02	0.29
Pacific Silver Fir	30.9	57	9	0.08	**0.12**	44.2	207	0.05	0.28
Engelmann Spruce	85.7	8	2	0.36	**0.24**	49.1	63	0.09	0.59
Alaska Yellow Cedar	33.3	2	0	0.00	**0.06**	78.0	11	0.01	0.29
High-elevation Shrub	56.7	23	2	0.08	**0.15**	49.6	134	0.06	0.37
Mountain Hemlock	40.0	19	2	0.08	**0.10**	52.0	137	0.04	0.27
Subalpine Fir	31.6	37	6	0.10	**0.09**	49.9	147	0.03	0.22
Heather/Herbaceous Sedge Meadow	19.2	28	2	0.02	**0.04**	52.8	173	0.02	0.12
Rock or Sparsely Vegetated	7.7	7	1	0.02	**0.02**	84.8	94	<0.01	0.08

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 46. Habitat-specific density estimates of American Robin at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	4.8	2	1	0.06	**0.06**	101.7	21	0.01	0.35
Conifer Deciduous Mix	16.0	5	2	0.10	**0.13**	53.3	31	0.05	0.35
Grand Fir	20.0	1	0	0.00	**0.13**	101.7	4	0.01	1.23
Western Hemlock	4.7	9	2	0.01	**0.03**	37.5	230	0.02	0.06
Western Redcedar	28.6	2	0	0.00	**0.18**	67.2	7	0.04	0.76
Mixed Douglas-fir/Western Hemlock	7.2	13	5	0.06	**0.07**	48.5	141	0.03	0.17
Douglas-fir	8.0	9	4	0.05	**0.03**	44	147	0.02	0.08
Mid-elevation Shrub	9.5	5	3	0.09	**0.07**	53.6	49	0.03	0.19
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	7.4	10	7	0.07	**0.04**	37.3	180	0.02	0.09
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	10.0	3	0	0.00	**0.04**	71.2	32	0.01	0.15
High-elevation Shrub	6.7	2	1	0.04	**0.04**	71.2	32	0.01	0.15
Mountain Hemlock	6.6	5	3	0.05	**0.04**	46.2	93	0.02	0.09
Subalpine Fir	27.9	36	10	0.12	**0.18**	24.9	149	0.11	0.30
Heather/Herbaceous Sedge Meadow	5.8	5	3	0.07	**0.05**	80.1	55	0.01	0.19
Rock or Sparsely Vegetated	10.0	3	0	0.00	**0.04**	71.2	32	0.01	0.15

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 47. Habitat-specific density estimates of Varied Thrush at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	23.8	7	1	0.06	**0.08**	43.7	21	0.03	0.20
Conifer Deciduous Mix	28.0	7	1	0.05	**0.06**	37.1	26	0.03	0.12
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	50.0	156	16	0.11	**0.19**	11.7	440	0.15	0.24
Western Redcedar	57.1	7	1	0.18	**0.18**	40.7	6	0.07	0.45
Mixed Douglas-fir/Western Hemlock	48.6	85	7	0.08	**0.16**	14.3	199	0.12	0.22
Douglas-fir	36.6	53	10	0.11	**0.11**	16.2	174	0.08	0.14
Mid-elevation Shrub	59.5	34	5	0.15	**0.21**	17.8	48	0.15	0.30
Noble Fir	80.0	20	5	0.42	**0.33**	20.3	19	0.22	0.50
Pacific Silver Fir	60.3	140	18	0.17	**0.24**	11.7	327	0.19	0.30
Engelmann Spruce	42.9	6	2	0.36	**0.18**	66.7	6	0.04	0.77
Alaska Yellow Cedar	33.3	2	0	0.00	**0.09**	63.4	5	0.02	0.39
High-elevation Shrub	40.0	21	5	0.21	**0.18**	27.7	31	0.10	0.31
Mountain Hemlock	66.7	27	5	0.21	**0.19**	22.4	32	0.12	0.29
Subalpine Fir	39.5	55	7	0.12	**0.18**	18.4	86	0.13	0.26
Heather/Herbaceous Sedge Meadow	27.9	44	8	0.10	**0.10**	20.6	115	0.07	0.15
Rock or Sparsely Vegetated	7.7	6	0	0.00	**0.02**	56.8	52	0.01	0.04

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 48. Habitat-specific density estimates of Yellow Warbler at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	4.8	1	1	0.06	**0.07**	100.5	20	0.01	0.43
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	9.5	5	5	0.15	**0.11**	53.3	41	0.04	0.31
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	2	1	0.04	**0.06**	71.1	29	0.02	0.23
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 49. Habitat-specific density estimates of Yellow-rumped Warbler at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.9	1	1	0.01	**0.01**	101.6	111	<0.01	0.04
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	2.2	3	1	0.01	**0.02**	60.1	135	0.01	0.06
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	7.9	7	5	0.08	**0.09**	44.1	75	0.04	0.20
Heather/Herbaceous Sedge Meadow	14.4	20	9	0.11	**0.18**	30.5	103	0.10	0.33
Rock or Sparsely Vegetated	3.8	3	0	0.00	**0.05**	75.4	51	0.01	0.21

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 50. Habitat-specific density estimates of Black-throated Gray Warbler at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	9.5	2	2	0.12	**0.11**	69.6	20	0.03	0.39
Conifer Deciduous Mix	8.0	2	2	0.10	**0.09**	69.9	24	0.02	0.32
Grand Fir	20.0	2	0	0.00	**0.22**	100.5	4	0.02	2.25
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	9.5	2	2	0.12	**0.11**	69.6	20	0.03	0.39
Douglas-fir	8.0	2	2	0.10	**0.09**	69.9	24	0.02	0.32
Mid-elevation Shrub	20.0	2	0	0.00	**0.22**	100.5	4	0.02	2.25
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 51. Habitat-specific density estimates of Townsend's Warbler at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	28.6	12	5	0.30	**0.37**	39.0	24	0.17	0.81
Conifer Deciduous Mix	28.0	10	6	0.31	**0.26**	37.1	29	0.13	0.55
Grand Fir	80.0	9	1	0.25	**1.05**	33.8	5	0.45	2.43
Western Hemlock	12.6	37	13	0.09	**0.12**	24.3	285	0.07	0.19
Western Redcedar	28.6	2	1	0.18	**0.19**	65.5	6	0.04	0.79
Mixed Douglas-fir/Western Hemlock	36.9	66	26	0.30	**0.32**	19.0	224	0.22	0.47
Douglas-fir	57.1	105	52	0.59	**0.56**	15.2	314	0.42	0.76
Mid-elevation Shrub	33.3	17	6	0.18	**0.35**	29.2	41	0.20	0.62
Noble Fir	13.3	3	0	0.00	**0.13**	73.2	15	0.03	0.53
Pacific Silver Fir	10.3	15	8	0.07	**0.06**	30.7	176	0.04	0.11
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	3.3	4	1	0.04	**0.12**	101.1	29	0.02	0.68
Mountain Hemlock	3.3	1	0	0.00	**0.03**	101.1	29	0.01	0.17
Subalpine Fir	13.2	14	11	0.18	**0.17**	34.9	75	0.09	0.33
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	3.8	3	0	0.00	**0.05**	75.4	51	0.01	0.20

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 52. Habitat-specific density estimates of MacGillivray's Warbler at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	4.0	1	1	0.05	**0.05**	104.3	24	0.01	0.28
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.9	1	1	0.01	**0.01**	104.3	111	<0.01	0.06
Mid-elevation Shrub	16.7	7	7	0.21	**0.15**	37.9	41	0.07	0.32
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 53. Habitat-specific density estimates of Wilson's Warbler at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	19.0	5	3	0.18	**0.31**	50.6	20	0.11	0.84
Conifer Deciduous Mix	8.0	2	1	0.05	**0.10**	70.1	24	0.03	0.39
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	1.8	2	1	0.01	**0.02**	71.2	110	0.01	0.08
Douglas-fir	1.8	2	0	0.00	**0.02**	71.2	111	0.01	0.08
Mid-elevation Shrub	23.8	10	6	0.18	**0.22**	31.6	41	0.12	0.42
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.7	1	1	0.01	**0.01**	100.6	135	<0.01	0.05
Engelmann Spruce	14.3	1	1	0.18	**0.19**	100.6	6	0.02	1.44
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	23.3	8	7	0.30	**0.25**	38.6	29	0.12	0.54
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	3.8	2	2	0.05	**0.04**	71.6	51	0.01	0.13

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 54. Habitat-specific density estimates of Western Tanager at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	4.8	1	1	0.06	**0.04**	101.2	20	0.01	0.22
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	2.1	5	1	0.01	**0.02**	51.9	189	0.01	0.05
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.9	1	0	0.00	**0.01**	101.2	110	<0.01	0.04
Douglas-fir	3.6	6	0	0.00	**0.04**	54.3	111	0.02	0.12
Mid-elevation Shrub	2.4	1	0	0.00	**0.01**	101.2	41	<0.01	0.08
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.7	1	1	0.01	**0.01**	101.2	135	<0.01	0.03
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	3.3	1	0	0.00	**0.02**	101.2	29	<0.01	0.11
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	1.9	2	1	0.01	**0.01**	72.1	103	<0.01	0.04
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 55. Habitat-specific density estimates of Chipping Sparrow at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	2.4	1	1	0.03	**0.02**	102.5	41	<0.01	0.11
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.7	2	1	0.01	**0.01**	100.7	135	<0.01	0.06
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	3.3	1	1	0.04	**0.03**	102.5	29	<0.01	0.16
Subalpine Fir	9.2	9	8	0.13	**0.10**	44.7	75	0.04	0.23
Heather/Herbaceous Sedge Meadow	18.3	25	17	0.21	**0.20**	33.8	103	0.10	0.38
Rock or Sparsely Vegetated	3.8	2	1	0.02	**0.02**	102.5	51	<0.01	0.09

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 56. Habitat-specific density estimates of Fox Sparrow at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	20.0	1	1	0.25	**0.24**	102.6	4	0.02	2.55
Western Hemlock	0.0	0	0	0.00	**0.00**				
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	**0.00**				
Douglas-fir	0.0	0	0	0.00	**0.00**				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	13.3	4	1	0.04	**0.07**	53.8	29	0.03	0.20
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	6.6	5	2	0.03	**0.03**	55.3	75	0.01	0.08
Heather/Herbaceous Sedge Meadow	13.5	17	1	0.01	**0.09**	36.9	103	0.04	0.18
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 57. Habitat-specific density estimates of Song Sparrow at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	9.5	3	3	0.18	**0.17**	76.6	20	0.04	0.71
Conifer Deciduous Mix	24.0	8	4	0.20	**0.39**	45.5	24	0.16	0.95
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	1.1	2	0	0.00	**0.01**	102.6	189	<0.01	0.03
Western Redcedar	14.3	1	0	0.00	**0.17**	102.6	6	0.02	1.38
Mixed Douglas-fir/Western Hemlock	0.9	1	1	0.01	**0.01**	102.6	110	<0.01	0.06
Douglas-fir	2.7	5	2	0.02	**0.05**	63.9	111	0.02	0.17
Mid-elevation Shrub	2.4	1	0	0.00	**0.01**	103.2	41	<0.01	0.07
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.7	2	2	0.02	**0.02**	102.6	135	<0.01	0.10
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	**0.00**				
Rock or Sparsely Vegetated	1.9	1	0	0.00	**0.01**	103.2	51	<0.01	0.06

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 58. Habitat-specific density estimates of Lincoln Sparrow at Mount Rainier National Park. An entry of '--' for the Adjusted Density Estimate indicates a habitat for which we did not model detectability.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	--				
Conifer Deciduous Mix	0.0	0	0	0.00	--				
Grand Fir	0.0	0	0	0.00	--				
Western Hemlock	0.0	0	0	0.00	--				
Western Redcedar	0.0	0	0	0.00	--				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	--				
Douglas-fir	0.0	0	0	0.00	--				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	--				
Pacific Silver Fir	0.0	0	0	0.00	--				
Engelmann Spruce	0.0	0	0	0.00	--				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	1.3	1	1	0.02	**0.03**	100.4	75	0.01	0.15
Heather/Herbaceous Sedge Meadow	3.8	4	2	0.02	**0.06**	57.9	103	0.02	0.18
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 59. Habitat-specific density estimates of Dark-eyed Junco at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	38.1	10	7	0.42	**0.58**	32.5	24	0.30	1.11
Conifer Deciduous Mix	36.0	13	11	0.56	**0.63**	32.9	28	0.33	1.22
Grand Fir	20.0	2	1	0.25	**0.49**	100.4	4	0.05	4.85
Western Hemlock	21.6	52	28	0.19	**0.27**	19.3	291	0.19	0.40
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	17.1	26	13	0.15	**0.25**	25	145	0.15	0.41
Douglas-fir	25.9	43	27	0.31	**0.43**	21.8	160	0.28	0.66
Mid-elevation Shrub	33.3	15	10	0.30	**0.67**	27.4	52	0.39	1.15
Noble Fir	46.7	8	4	0.34	**0.65**	32.3	17	0.33	1.26
Pacific Silver Fir	35.3	64	34	0.32	**0.51**	16.7	245	0.37	0.7
Engelmann Spruce	28.6	5	3	0.55	**0.87**	67.0	6	0.2	3.79
Alaska Yellow Cedar	33.3	4	2	0.42	**1.44**	63.9	5	0.33	6.36
High-elevation Shrub	46.7	26	18	0.76	**1.73**	26.6	37	1.02	2.94
Mountain Hemlock	56.7	27	23	0.98	**1.87**	21.1	44	1.23	2.85
Subalpine Fir	56.6	72	52	0.87	**1.96**	16.5	149	1.42	2.71
Heather/Herbaceous Sedge Meadow	68.3	153	94	1.15	**2.76**	14.8	239	2.07	3.69
Rock or Sparsely Vegetated	30.8	20	12	0.29	**0.66**	29.1	63	0.38	1.17

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 60. Habitat-specific density estimates of Red-winged Blackbird at Mount Rainier National Park. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	4.0	1	0	0.00	**0.05**	102.6	24	0.01	0.28
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	0.5	1	0	0.00	**0.01**	102.6	189	<0.01	0.03
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	0.9	1	0	0.00	**0.01**	102.6	110	<0.01	0.06
Douglas-fir	1.8	4	1	0.01	**0.04**	82.2	111	0.01	0.18
Mid-elevation Shrub	0.0	0	0	0.00	--				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	0.0	0	0	0.00	**0.00**				
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	--				
High-elevation Shrub	0.0	0	0	0.00	--				
Mountain Hemlock	0.0	0	0	0.00	--				
Subalpine Fir	0.0	0	0	0.00	--				
Heather/Herbaceous Sedge Meadow	0.0	0	0	0.00	--				
Rock or Sparsely Vegetated	0.0	0	0	0.00	--				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 61. Habitat-specific density estimates of Gray-crowned Rosy-Finch at Mount Rainier National Park. An entry of '--' for the Adjusted Density Estimate indicates a species for which we did not model detectability.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	--				
Conifer Deciduous Mix	0.0	0	0	0.00	--				
Grand Fir	0.0	0	0	0.00	--				
Western Hemlock	0.0	0	0	0.00	--				
Western Redcedar	0.0	0	0	0.00	--				
Mixed Douglas-fir/Western Hemlock	0.0	0	0	0.00	--				
Douglas-fir	0.0	0	0	0.00	--				
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	--				
Pacific Silver Fir	0.0	0	0	0.00	--				
Engelmann Spruce	0.0	0	0	0.00	--				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	0.0	0	0	0.00	**0.00**				
Subalpine Fir	0.0	0	0	0.00	**0.00**				
Heather/Herbaceous Sedge Meadow	1.9	3	2	0.02	**0.13**	90.8	27	0.03	0.64
Rock or Sparsely Vegetated	13.5	8	2	0.05	**0.05**	57.1	51	0.02	0.14

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 62. Habitat-specific density estimates of Red Crossbill at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	12.0	4	1	0.05	**0.15**	70.8	24	0.04	0.54
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	5.8	13	5	0.03	**0.11**	37.6	189	0.05	0.22
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	8.1	15	10	0.11	**0.25**	41.2	110	0.11	0.54
Douglas-fir	2.7	3	3	0.03	**0.05**	59.1	111	0.02	0.14
Mid-elevation Shrub	7.1	3	2	0.06	**0.07**	58.4	41	0.02	0.20
Noble Fir	20.0	3	1	0.08	**0.24**	69.7	14	0.06	0.93
Pacific Silver Fir	5.9	10	4	0.04	**0.11**	41.4	135	0.05	0.23
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	0.0	0	0	0.00	**0.00**				
Mountain Hemlock	10.0	4	2	0.08	**0.13**	61.4	29	0.04	0.40
Subalpine Fir	5.3	4	2	0.03	**0.05**	51.4	75	0.02	0.13
Heather/Herbaceous Sedge Meadow	4.8	6	1	0.01	**0.05**	54.5	103	0.02	0.13
Rock or Sparsely Vegetated	1.9	2	0	0.00	**0.04**	101.2	51	0.01	0.20

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 63. Habitat-specific density estimates of Pine Siskin at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	20.0	2	1	0.25	0.37	100.8	4	0.04	3.65
Western Hemlock	9.5	22	9	0.06	0.07	33.7	245	0.04	0.14
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	10.8	18	12	0.14	0.15	37.1	138	0.07	0.30
Douglas-fir	6.3	11	8	0.09	0.07	46.8	128	0.03	0.18
Mid-elevation Shrub	7.1	3	1	0.03	0.05	63.8	66	0.01	0.15
Noble Fir	46.7	10	2	0.17	0.61	37.0	18	0.29	1.30
Pacific Silver Fir	30.1	60	33	0.31	0.38	20.1	244	0.26	0.56
Engelmann Spruce	42.9	4	2	0.36	0.53	53.5	7	0.16	1.74
Alaska Yellow Cedar	16.7	1	0	0.00	0.11	104.4	6	0.01	0.88
High-elevation Shrub	33.3	20	10	0.42	0.41	44.3	89	0.18	0.94
Mountain Hemlock	46.7	18	12	0.51	0.39	39.8	123	0.18	0.82
Subalpine Fir	36.8	41	23	0.39	0.33	35.1	257	0.17	0.64
Heather/Herbaceous Sedge Meadow	55.8	101	43	0.53	0.72	37.7	334	0.35	1.47
Rock or Sparsely Vegetated	28.8	20	3	0.07	0.20	41.7	166	0.09	0.44

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 64. Habitat-specific density estimates of Evening Grosbeak at Mount Rainier National Park.

Habitat	Percent of Points with Detections[1]	Non-flyover Detections[2]	Non-flyover Detections within 50 m[3]	Unadjusted Density (birds/ha)[4]	Adjusted Density[5]				
					Estimate (birds/ha)	CV	df	Lower 95% C.I.	Upper 95% C.I.
Red Alder	0.0	0	0	0.00	**0.00**				
Conifer Deciduous Mix	0.0	0	0	0.00	**0.00**				
Grand Fir	0.0	0	0	0.00	**0.00**				
Western Hemlock	2.1	7	2	0.01	**0.03**	63.9	189	0.01	0.10
Western Redcedar	0.0	0	0	0.00	**0.00**				
Mixed Douglas-fir/Western Hemlock	2.7	7	1	0.01	**0.06**	63.7	110	0.02	0.20
Douglas-fir	0.9	1	1	0.01	**0.01**	101.2	111	<0.01	0.05
Mid-elevation Shrub	0.0	0	0	0.00	**0.00**				
Noble Fir	0.0	0	0	0.00	**0.00**				
Pacific Silver Fir	5.9	9	5	0.05	**0.07**	39.1	135	0.03	0.14
Engelmann Spruce	0.0	0	0	0.00	**0.00**				
Alaska Yellow Cedar	0.0	0	0	0.00	**0.00**				
High-elevation Shrub	6.7	2	0	0.00	**0.06**	71.1	29	0.02	0.23
Mountain Hemlock	13.3	4	0	0.00	**0.03**	101.1	29	0.01	0.17
Subalpine Fir	5.3	4	1	0.02	**0.05**	51.2	75	0.02	0.13
Heather/Herbaceous Sedge Meadow	1.9	3	0	0.00	**0.03**	75.7	103	0.01	0.10
Rock or Sparsely Vegetated	0.0	0	0	0.00	**0.00**				

[1]Percent of points where the species was detected, including flyovers.
[2]Number of individual detections at any distance during point counts, excluding flyovers.
[3]Number of individual birds detected within 50 m of the observer during point counts, excluding flyovers, with no adjustment for detectability.
[4]Based on number of detections within 50 m of the observer excluding flyovers, with no adjustment for detectability.
[5]Estimates and statistics calculated using the software Distance 4.0 Release 2 (Buckland et al. 2003). See Methods for details.

Table 65. Estimates of total bird density (all species pooled) for each major habitat in which we completed at least ten point counts (excludes Western Redcedar, Grand Fir, Engelmann Spruce, and Alaska Yellow Cedar).

Habitat	No. of Point Counts Completed	Density of All Species Pooled (birds/ha)
Conifer Deciduous Mix	25	9.19
Noble Fir	15	8.87
Red Alder	21	8.04
Pacific Silver Fir	136	7.75
Subalpine Fir	76	7.61
Mountain Hemlock	30	7.38
Heather/Herbaceous Sedge Meadow	104	6.63
Douglas-fir	112	6.61
Mixed Douglas-fir/Western Hemlock	111	6.54
High-elevation Shrub	30	6.28
Western Hemlock	190	6.13
Mid-elevation Shrub	42	5.08
Rock or Sparsely Vegetated	52	2.27

Table 66. Number of species detected in each major habitat in which we completed at least ten point counts (excludes Western Redcedar, Grand Fir, Engelmann Spruce, and Alaska Yellow Cedar). Note that effort (number of points completed) varies greatly across habitats.

Habitat	No. of Point Counts Completed	No. of Species Detected During Point Counts
Douglas-fir	112	42
Heather/Herbaceous Sedge Meadow	104	41
Rock or Sparsely Vegetated	52	39
Pacific Silver Fir	136	37
Western Hemlock	190	36
Mixed Douglas-fir/Western Hemlock	111	35
Mid-elevation Shrub	42	35
Subalpine Fir	76	34
Conifer Deciduous Mix	25	29
High-elevation Shrub	30	28
Mountain Hemlock	30	23
Red Alder	21	22
Noble Fir	15	17

Transect Start Points

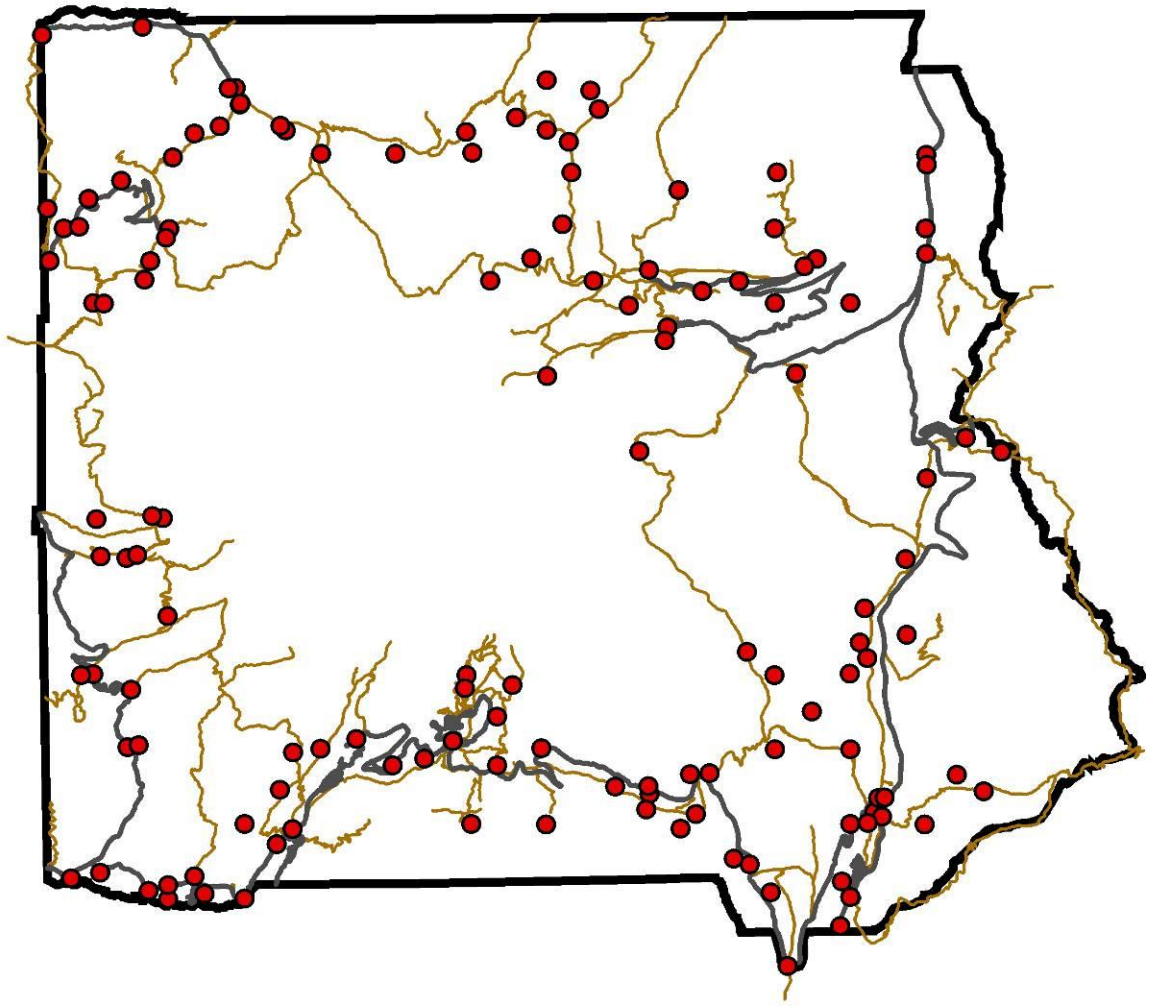

Figure 1. Location of start points for all 134 point count transects conducted at Mount Rainier National Park. Gray lines indicate roads. Gold lines indicate trails.

Red Alder Sample Points

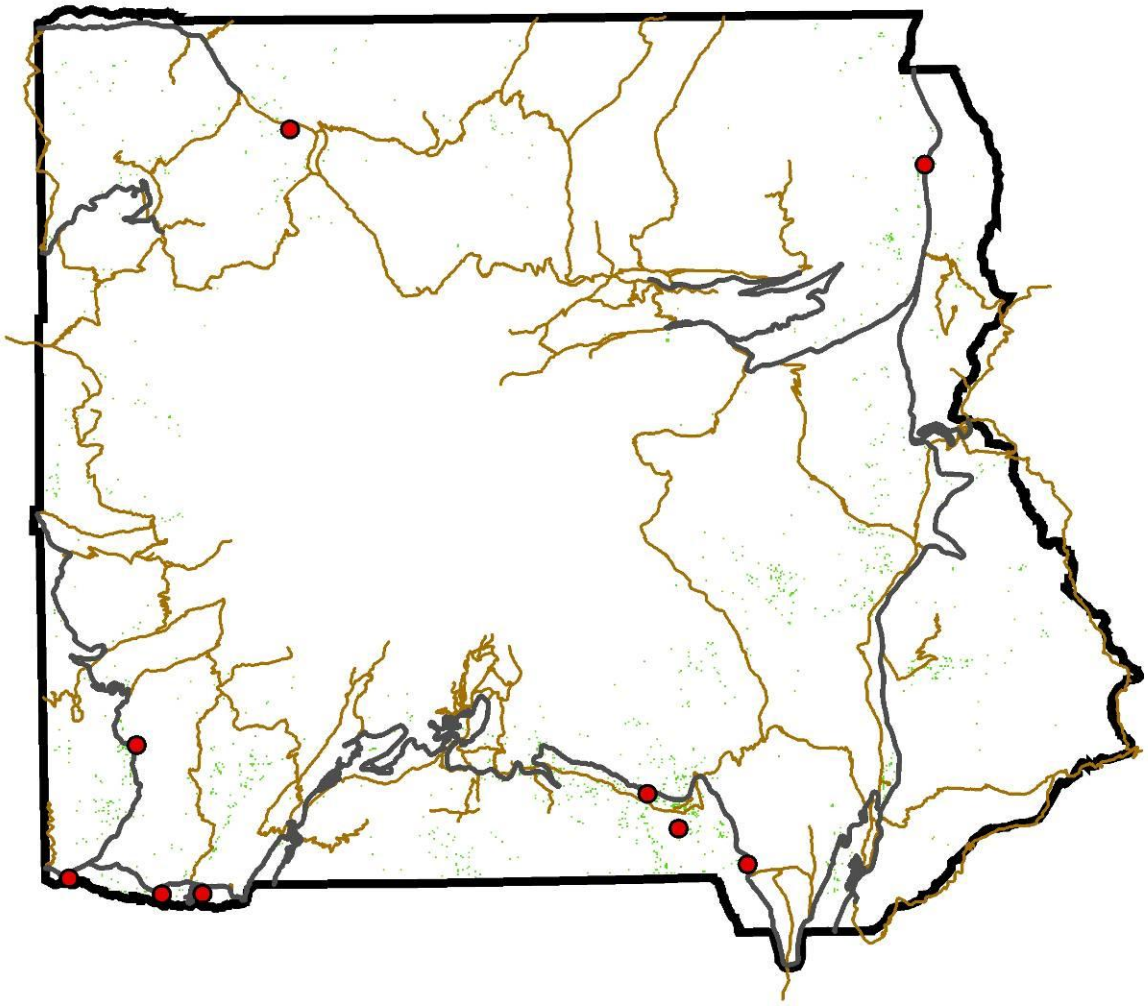

Figure 2. Green shading indicates areas mapped as Red Alder in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the nine transects that included at least one of the 21 points classified as Red Alder.

Conifer Deciduous Mix Sample Points

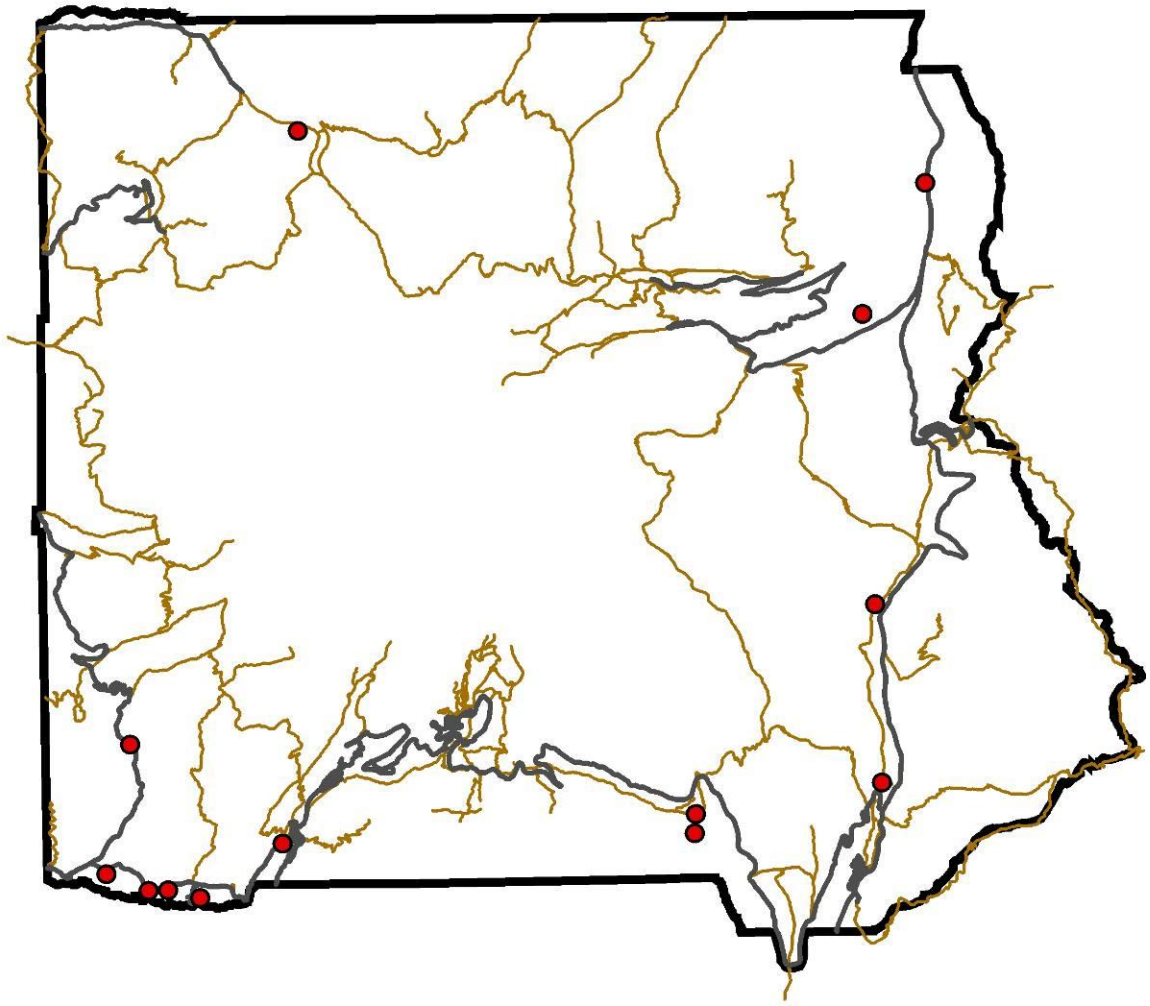

Figure 3. Red dots indicate the 13 transects that included at least one of the 25 points classified as Conifer Deciduous Mix.

Grand Fir Sample Points

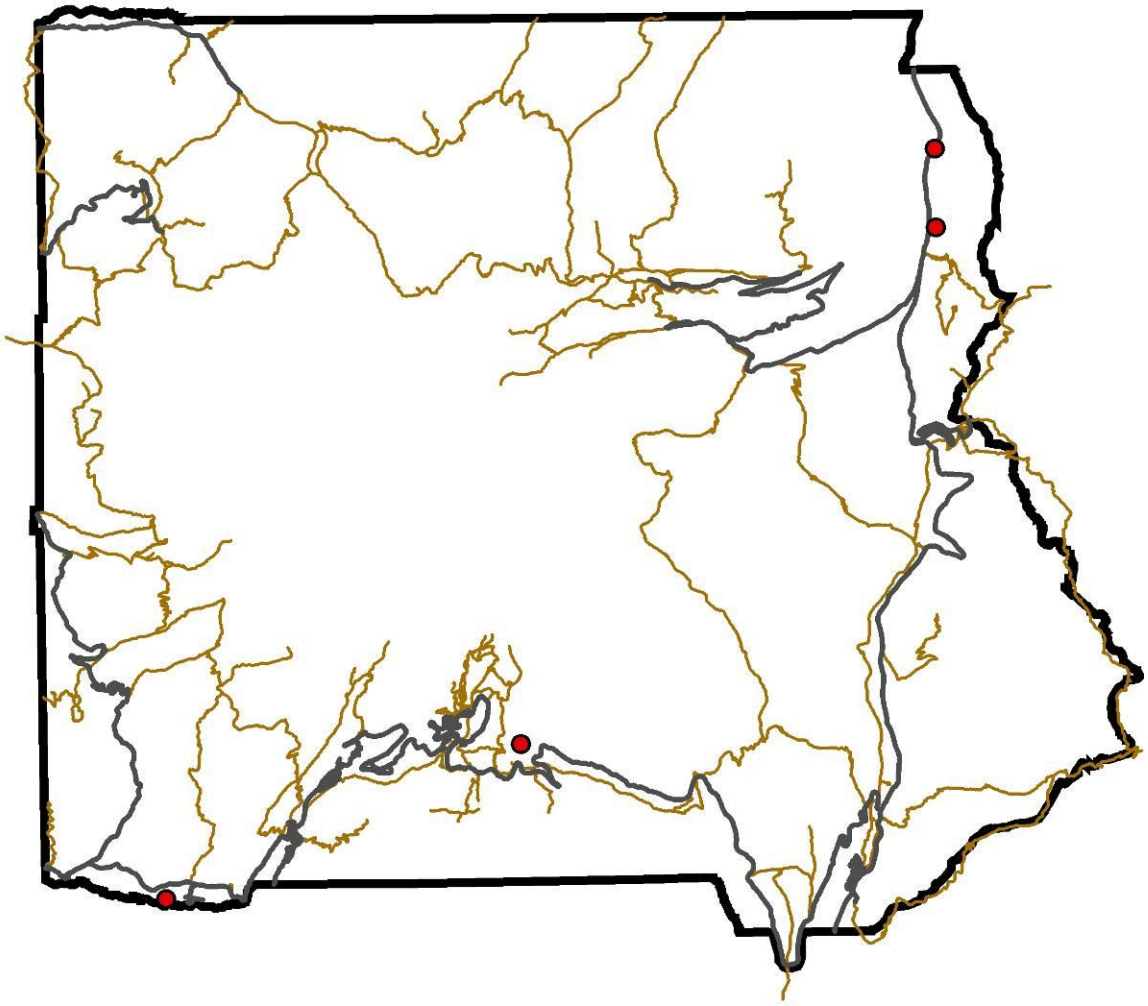

Figure 4. Red dots indicate the four transects that included at least one of the five points classified as Grand Fir.

Western Hemlock Sample Points

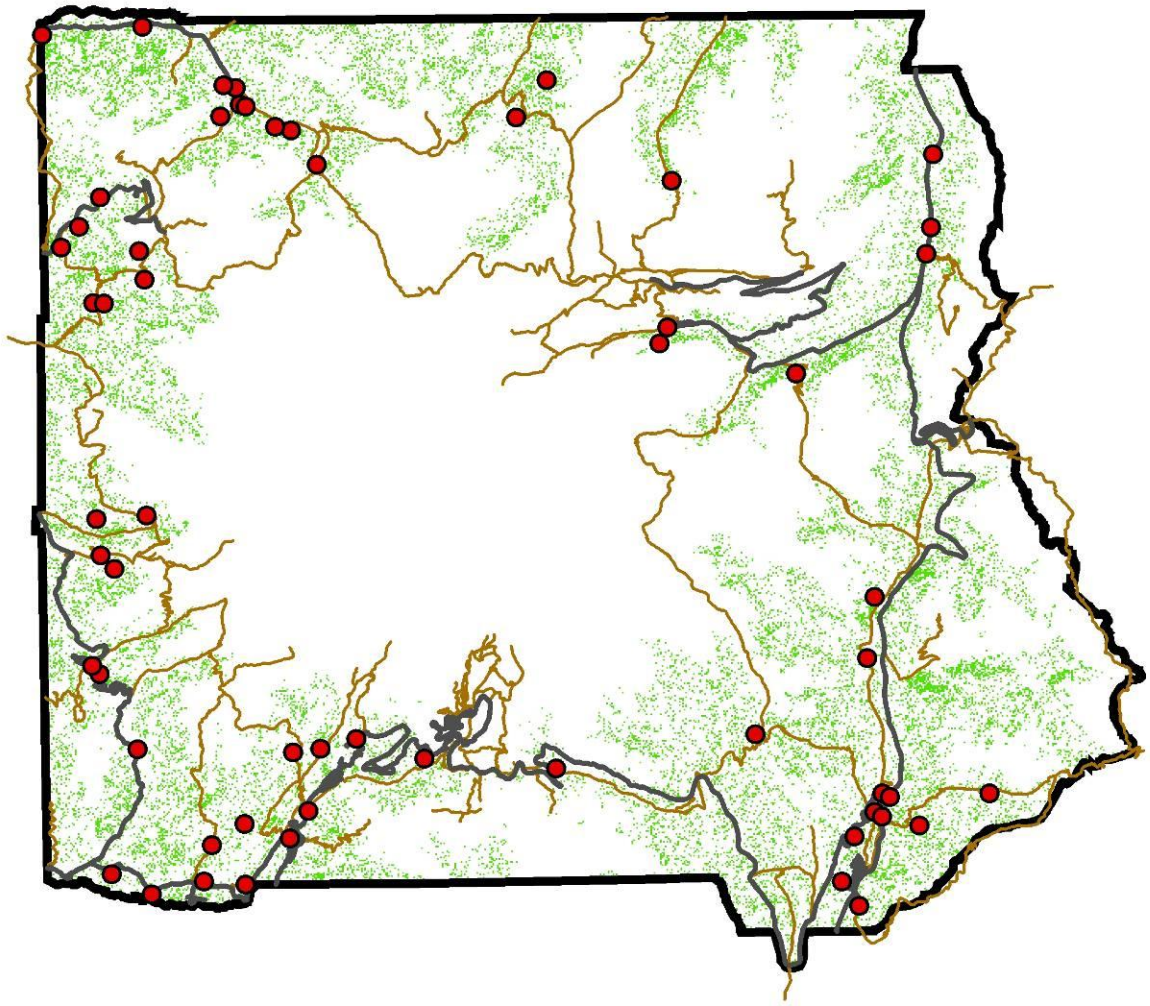

Figure 5. Green shading indicates areas mapped as Western Hemlock in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 58 transects that included at least one of the 190 points classified as Western Hemlock.

Western Redcedar Sample Points

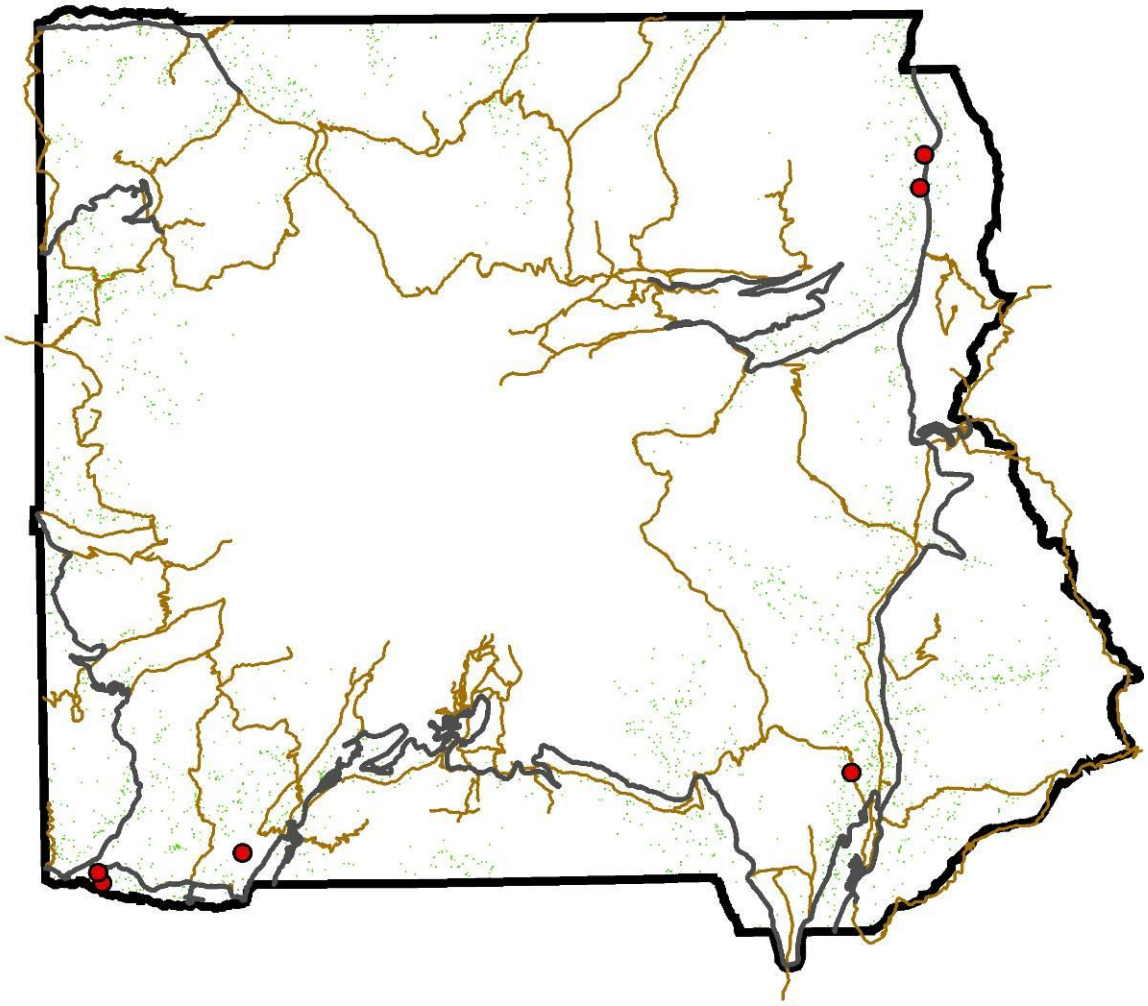

Figure 6. Green shading indicates areas mapped as Western Redcedar in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 6 transects that included at least one of the seven points classified as Western Redcedar.

Mixed Douglas-fir/Western Hemlock Sample Points

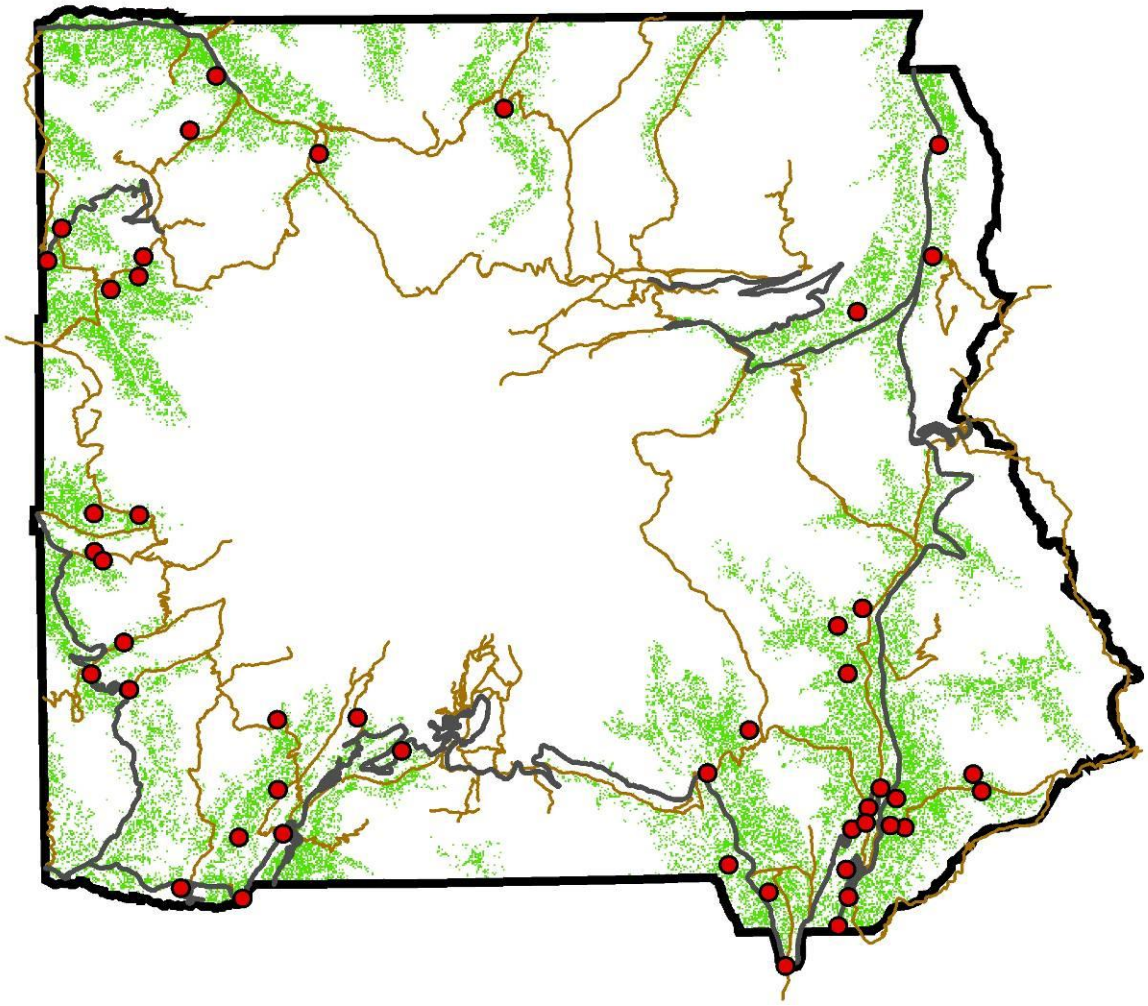

Figure 7. Green shading indicates areas mapped as Mixed Douglas-fir/Western Hemlock in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 47 transects that included at least one of the 111 points classified as Mixed Douglas-fir/Western Hemlock.

Douglas-fir Sample Points

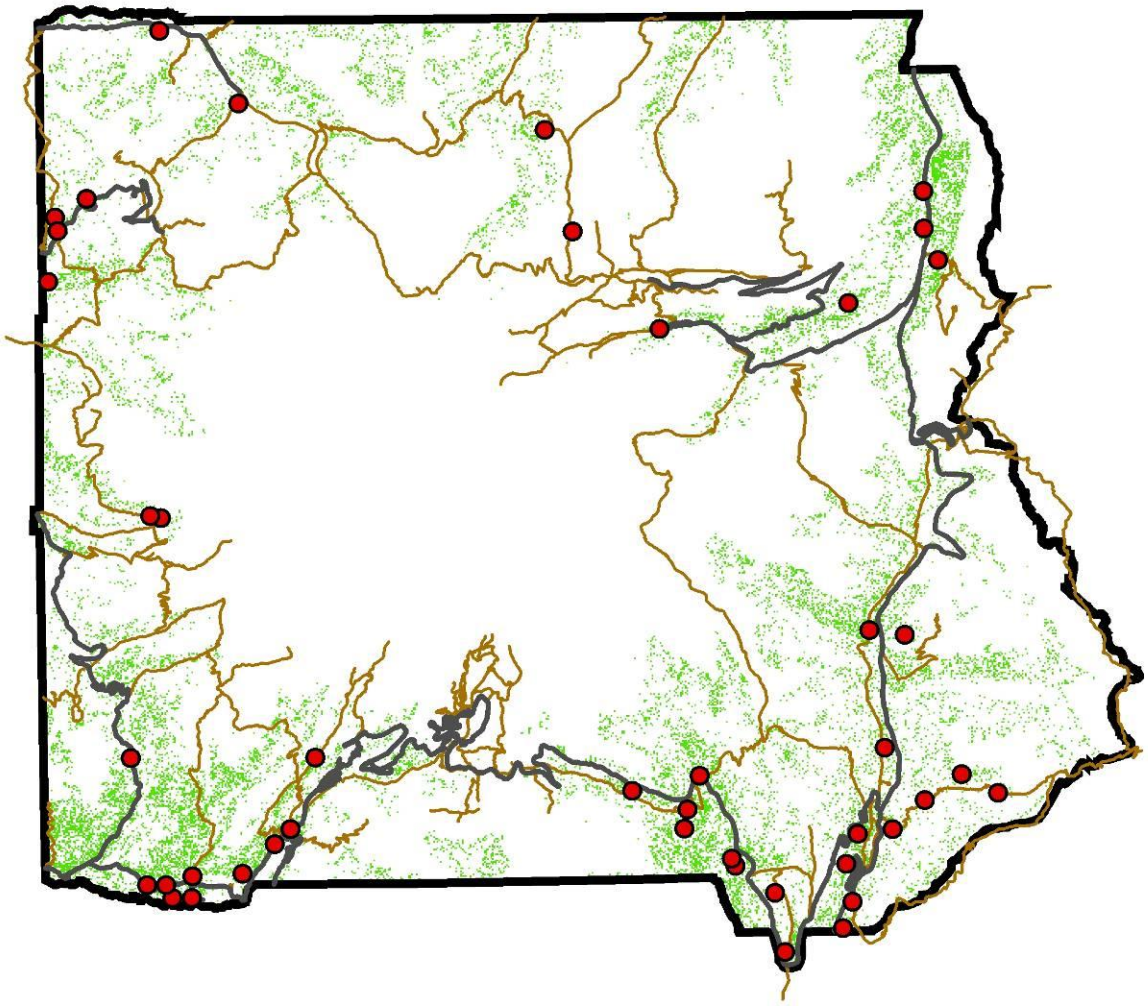

Figure 8. Green shading indicates areas mapped as Douglas-fir in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 44 transects that included at least one of the 112 points classified as Douglas-fir.

Shrub Sample Points

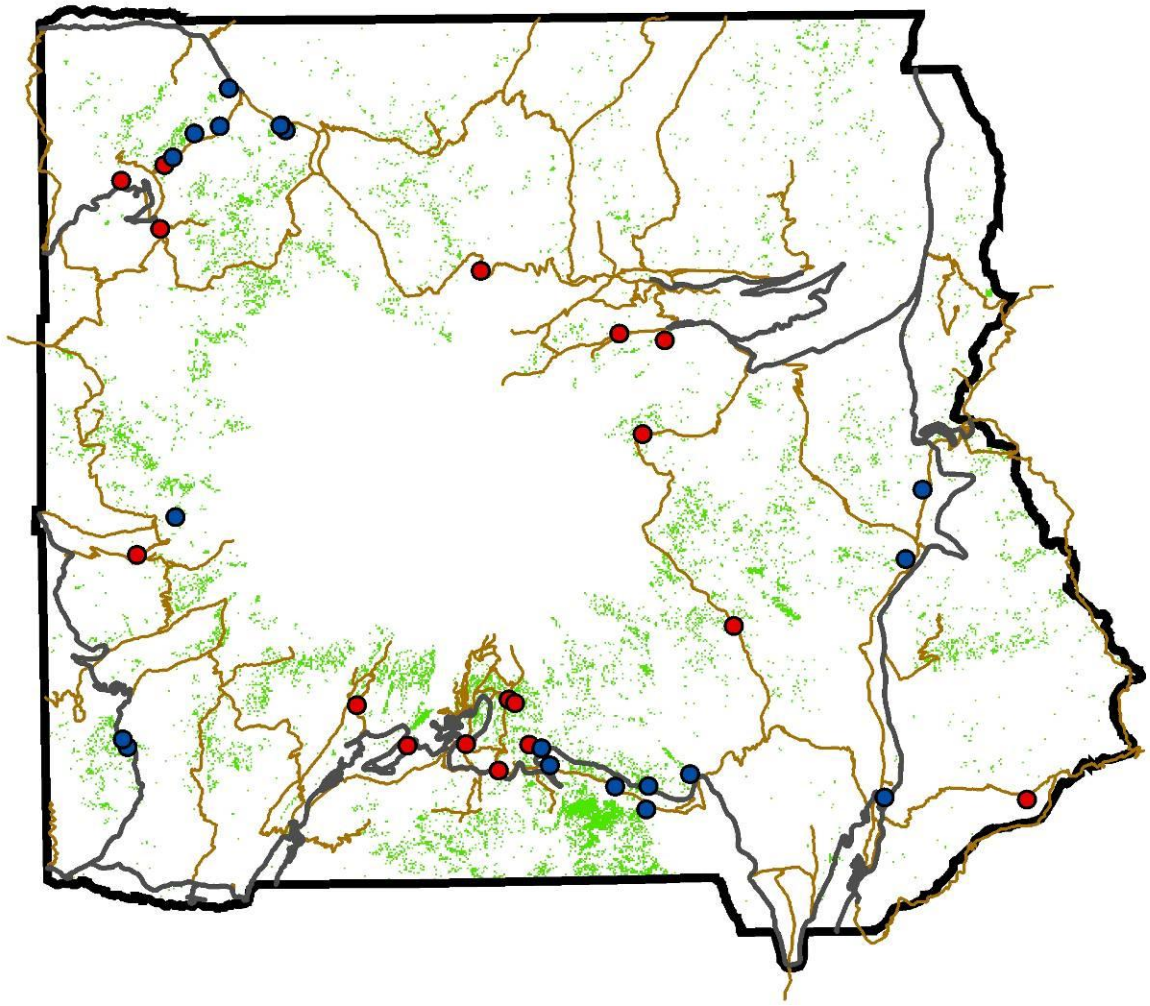

Figure 9. Green shading indicates areas mapped as Shrub in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 17 transects that included at least one of the 30 points classified as High-elevation Shrub. Blue dots indicate the 19 transects that included at least one of the 42 points classified as Mid-elevation Shrub.

Noble Fir Sample Points

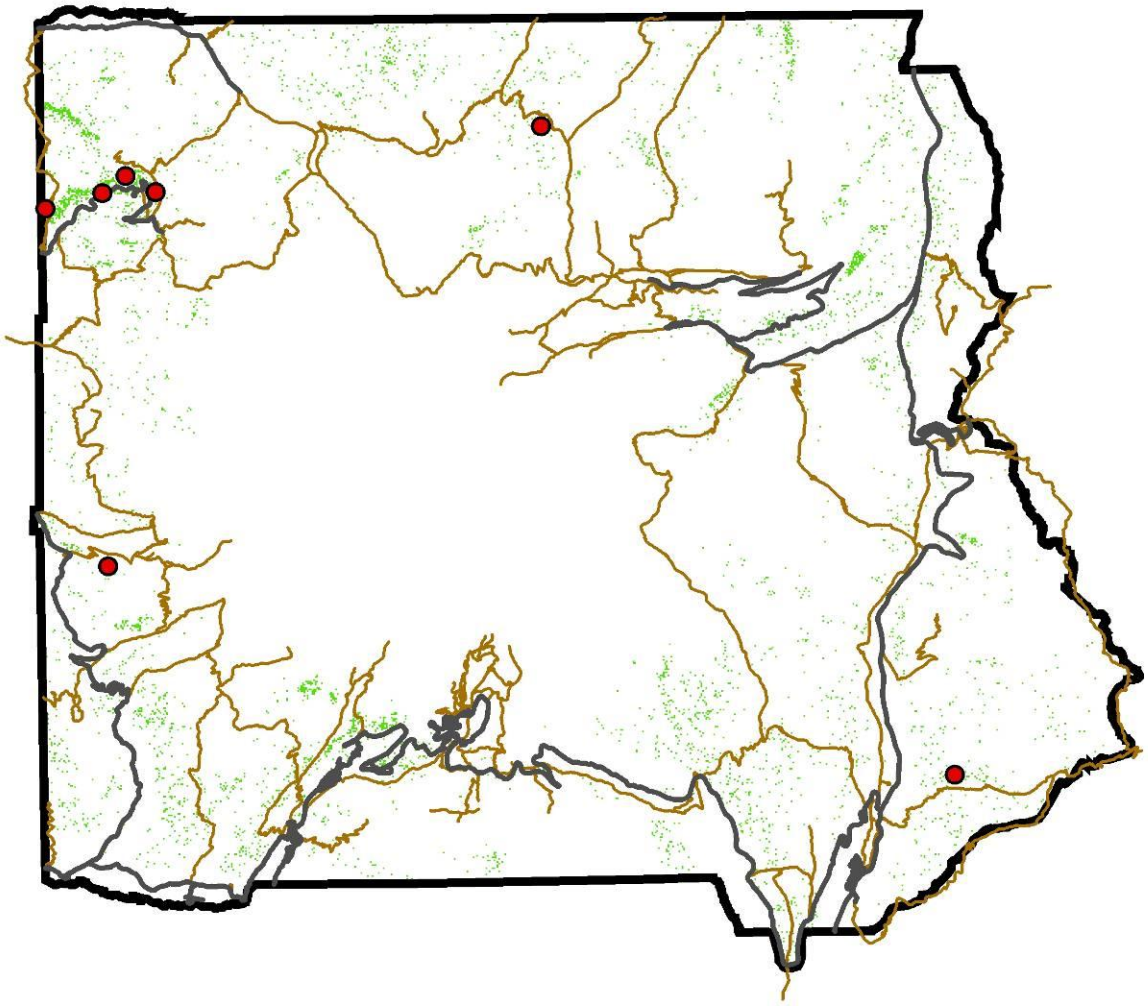

Figure 10. Green shading indicates areas mapped as Noble Fir in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the seven transects that included at least one of the 15 points classified as Noble Fir.

Pacific Silver Fir Sample Points

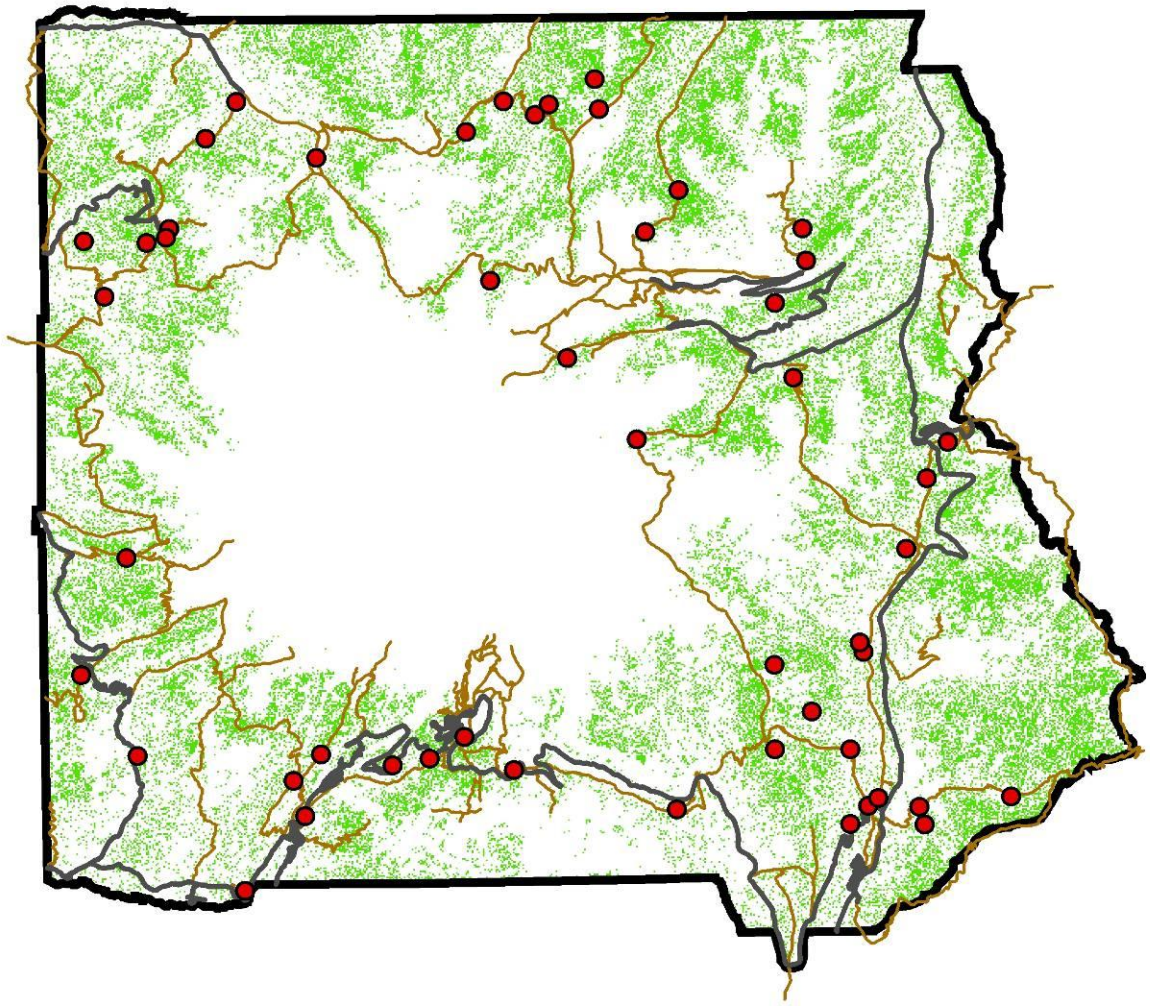

Figure 11. Green shading indicates areas mapped as Pacific Silver Fir in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 50 transects that included at least one of the 136 points classified as Pacific Silver Fir.

Engelmann Spruce Sample Points

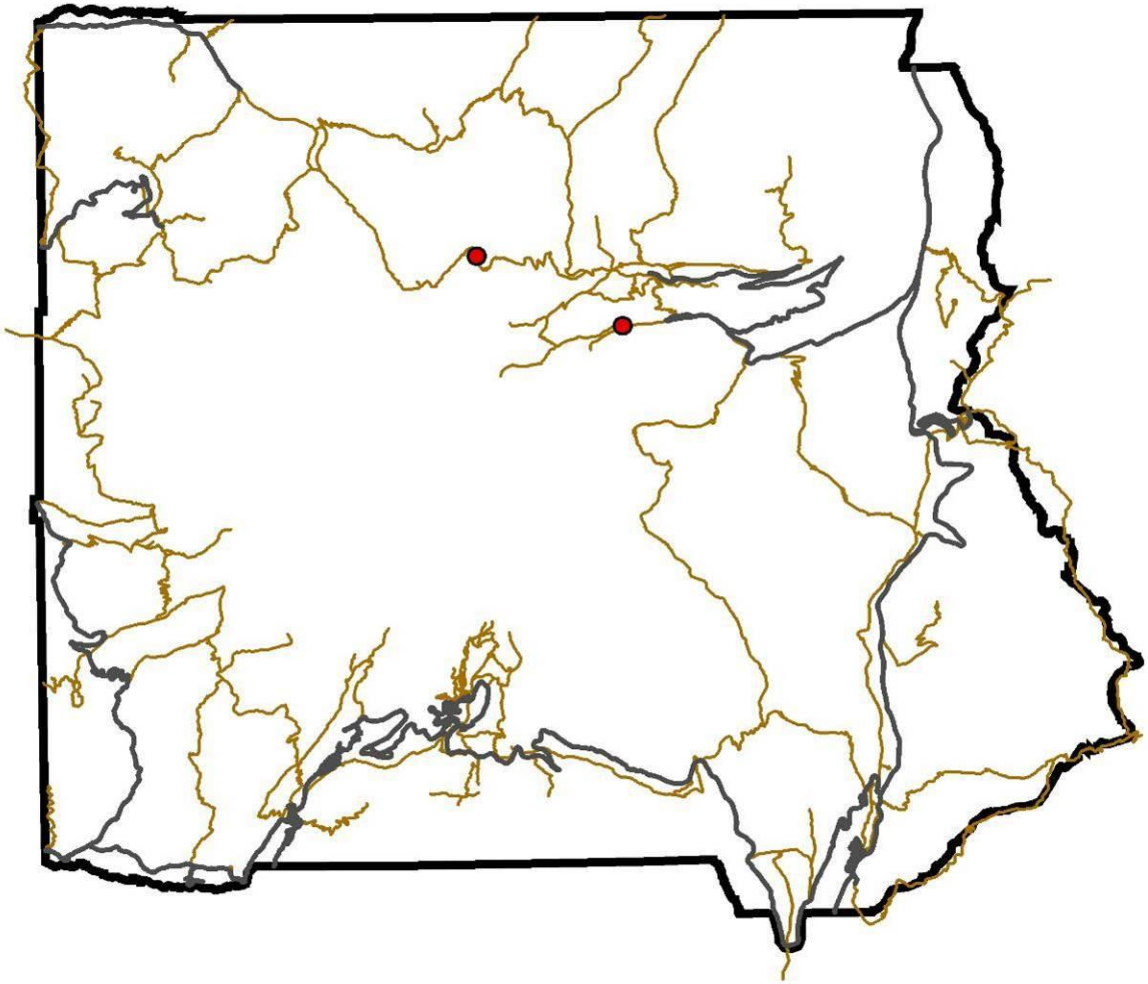

Figure 12. Red dots indicate the two transects that included at least one of the seven points classified as Engelmann Spruce.

Alaska Yellow Cedar Sample Points

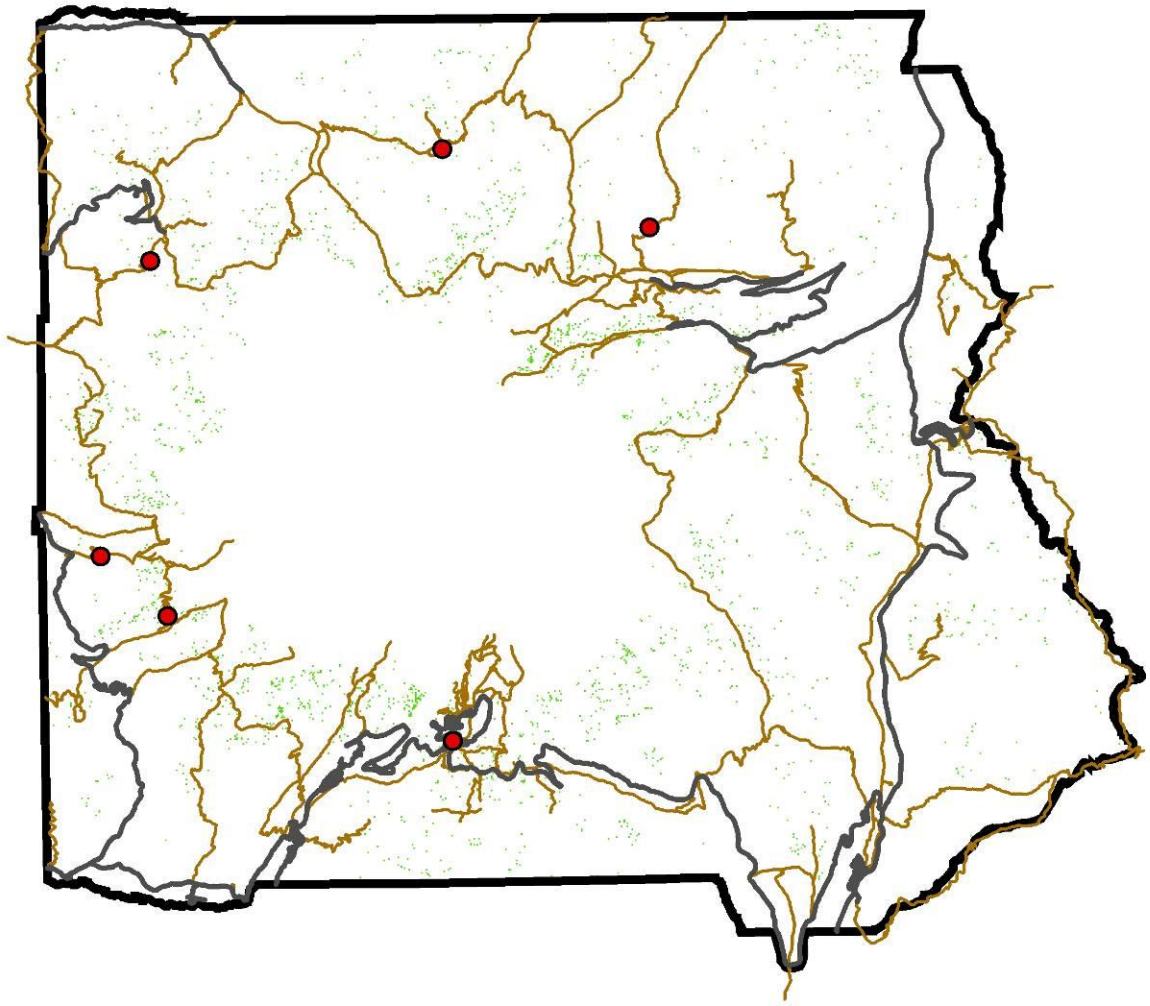

Figure 13. Green shading indicates areas mapped as Alaska Yellow Cedar in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the six transects that included at least one of the six points classified as Alaska Yellow Cedar.

Mountain Hemlock Sample Points

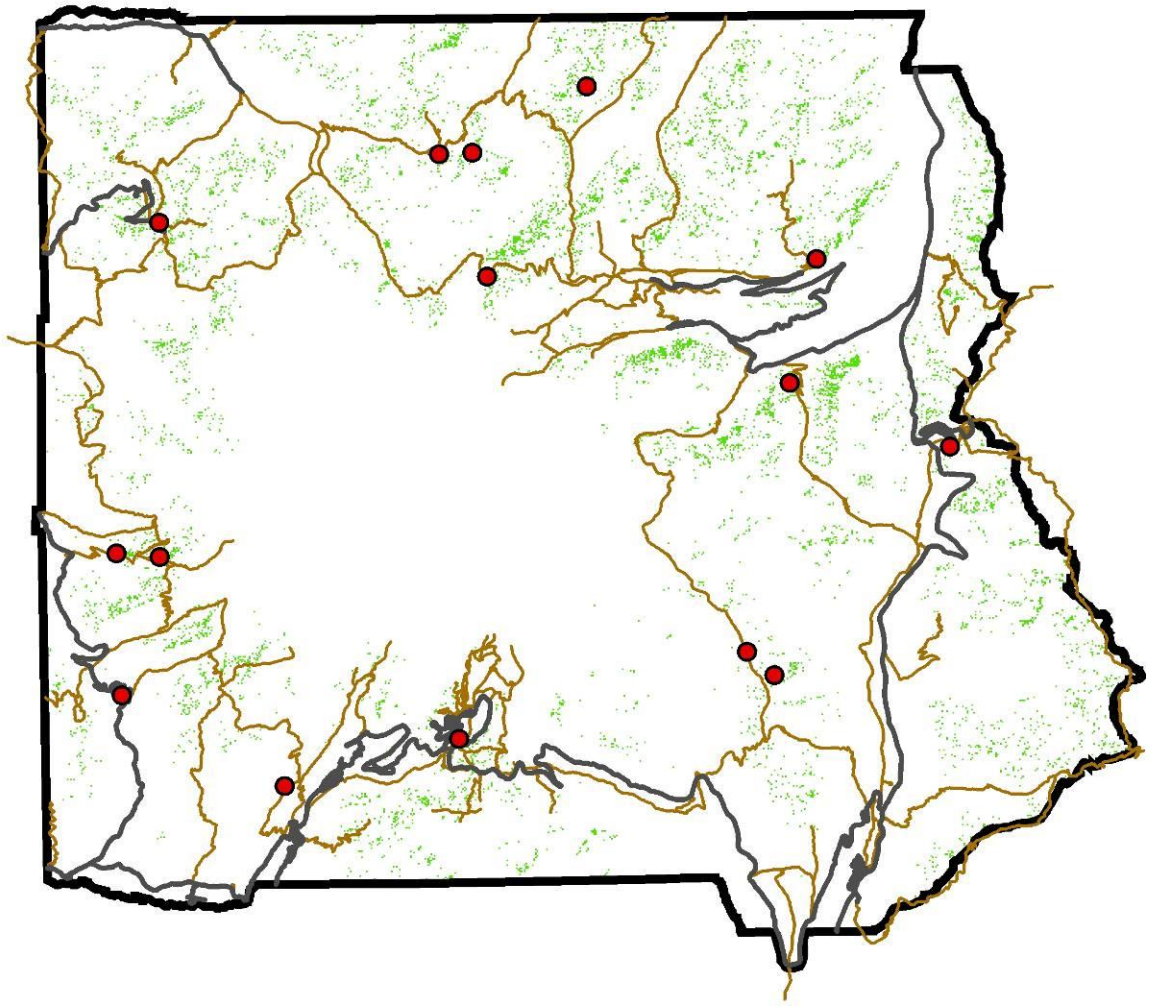

Figure 14. Green shading indicates areas mapped as Mountain Hemlock in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 15 transects that included at least one of the 30 points classified as Mountain Hemlock.

Subalpine Fir Sample Points

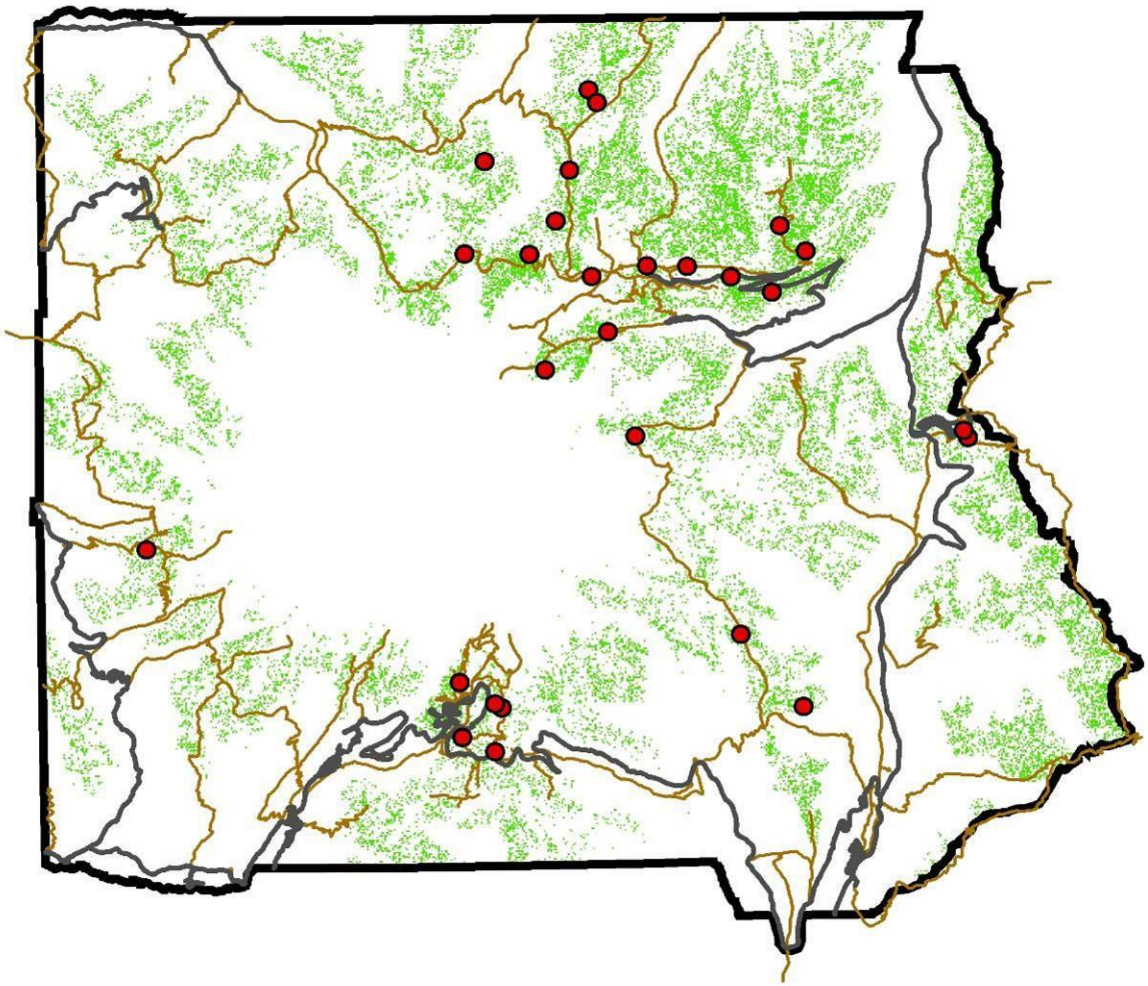

Figure 15. Green shading indicates areas mapped as Subalpine Fir in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 27 transects that included at least one of the 76 points classified as Subalpine Fir.

Heather/Herbaceous Sedge Meadow Sample Points

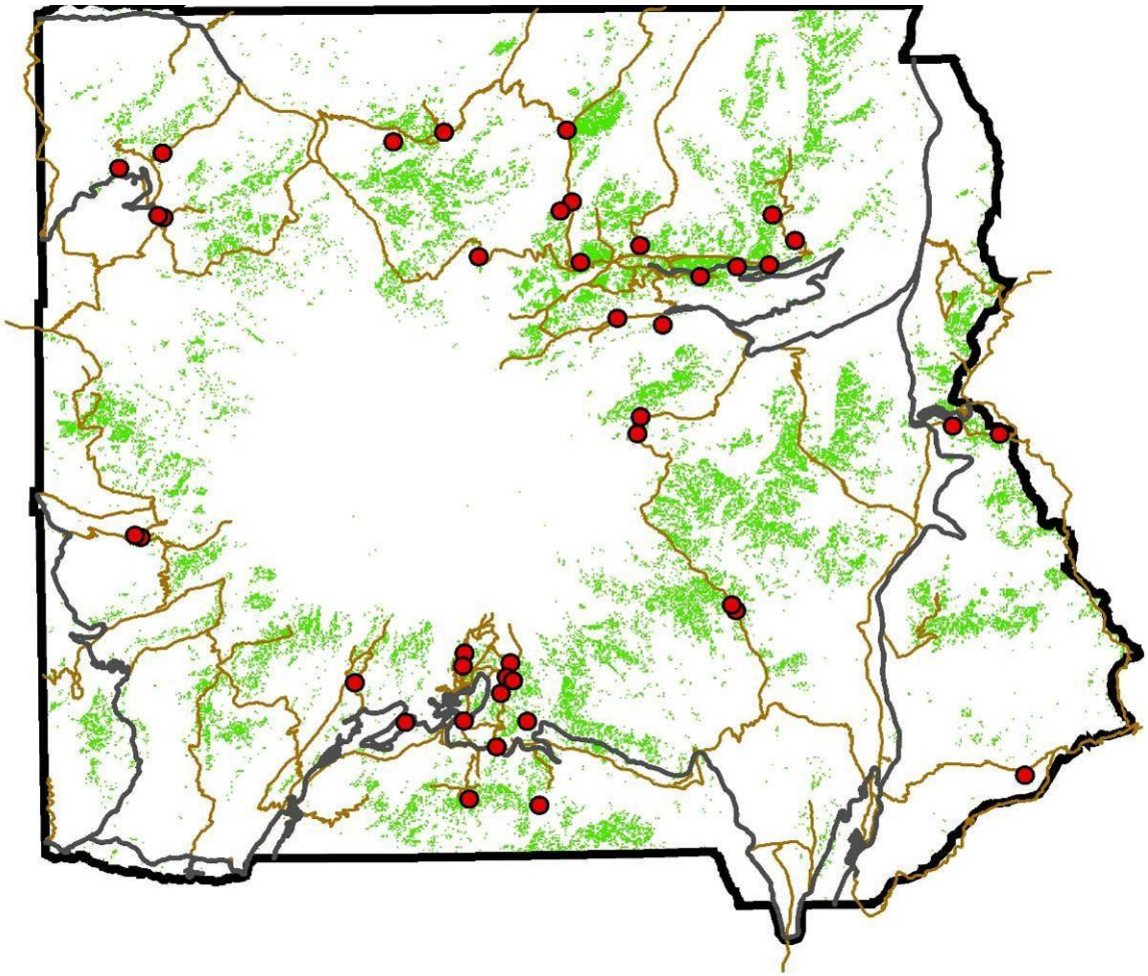

Figure 16. Green shading indicates areas mapped as either Heather or Herbaceous Sedge Meadow in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 24 transects that included at least one of the 104 points classified as Heather/Herbaceous Sedge Meadow.

Rock or Sparsely Vegetated Sample Points

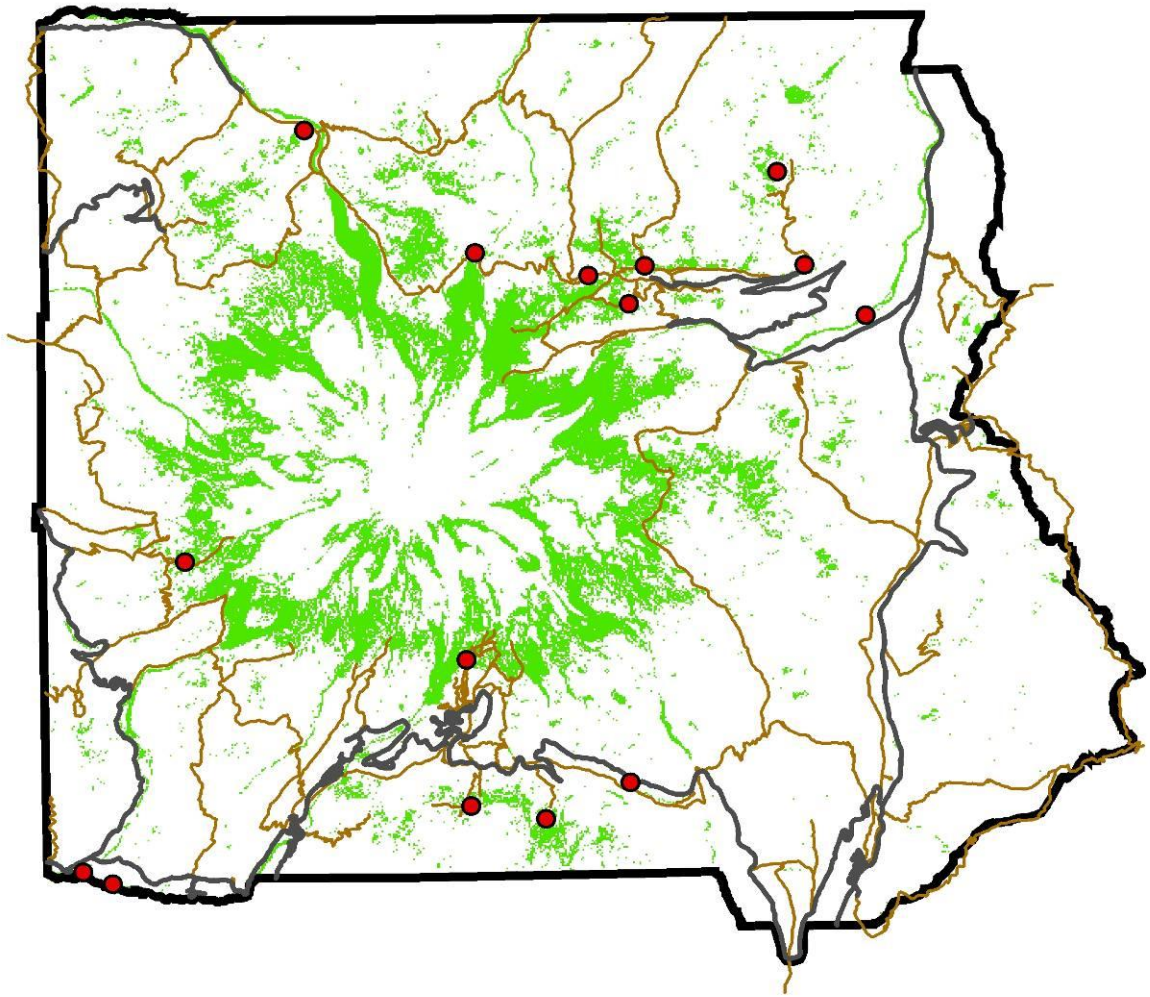

Figure 17. Green shading indicates areas mapped as Rock or Sparsely Vegetated in the Pacific Meridian Resources (1996) GIS coverage. Red dots indicate the 15 transects that included at least one of the 52 points classified as Rock or Sparsely Vegetated.

Appendix A. Scientific Names of All Bird Species Listed in this Report

Common Name	Scientific Name[1]
Great Blue Heron	*Ardea herodias*
Turkey Vulture	*Cathartes aura*
Canada Goose	*Branta canadensis*
Mallard	*Anas platyrhynchos*
Harlequin Duck	*Histrionicus histrionicus*
Osprey	*Pandion haliaetus*
Northern Harrier	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Northern Goshawk	*Accipiter gentilis*
Red-tailed Hawk	*Buteo jamaicensis*
Rough-legged Hawk	*Buteo lagopus*
Golden Eagle	*Aquila chrysaetos*
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
White-tailed Ptarmigan	*Lagopus leucurus*
Blue Grouse	*Dendragapus obscurus*
Spotted Sandpiper	*Actitis macularia*
Marbled Murrelet	*Brachyramphus marmoratus*
Band-tailed Pigeon	*Columba fasciata*
Western Screech-Owl	*Otus kennicottii*
Great Horned Owl	*Bubo virginianus*
Northern Pygmy-Owl	*Glaucidium gnoma*
Barred Owl	*Strix varia*
Common Nighthawk	*Chordeiles minor*
Black Swift	*Cypseloides niger*
Vaux's Swift	*Chaetura vauxi*
Rufous Hummingbird	*Selasphorus rufus*
Belted Kingfisher	*Ceryle alcyon*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Three-toed Woodpecker	*Picoides tridactylus*
Northern Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Olive-sided Flycatcher	*Contopus cooperi*
Western Wood-Pewee	*Contopus sordidulus*
Hammond's Flycatcher	*Empidonax hammondii*
Dusky Flycatcher	*Empidonax oberholseri*
Pacific-slope Flycatcher	*Empidonax difficilis*
Hutton's Vireo	*Vireo huttoni*
Warbling Vireo	*Vireo gilvus*
Gray Jay	*Perisoreus canadensis*

Appendix A. Scientific Names of All Bird Species Listed in this Report (continued).

Common Name	Scientific Name[1]
Steller's Jay	*Cyanocitta stelleri*
Clark's Nutcracker	*Nucifraga columbiana*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
Barn Swallow	*Hirundo rustica*
Mountain Chickadee	*Poecile gambeli*
Chestnut-backed Chickadee	*Poecile rufescens*
Bushtit	*Psaltriparus minimus*
Red-breasted Nuthatch	*Sitta canadensis*
Brown Creeper	*Certhia americana*
Canyon Wren	*Catherpes mexicanus*
Winter Wren	*Troglodytes troglodytes*
American Dipper	*Cinclus mexicanus*
Golden-crowned Kinglet	*Regulus satrapa*
Ruby-crowned Kinglet	*Regulus calendula*
Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*
Swainson's Thrush	*Catharus ustulatus*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Varied Thrush	*Ixoreus naevius*
American Pipit	*Anthus rubescens*
Cedar Waxwing	*Bombycilla cedrorum*
Orange-crowned Warbler	*Vermivora celata*
Yellow Warbler	*Dendroica petechia*
Yellow-rumped Warbler	*Dendroica coronata*
Black-throated Gray Warbler	*Dendroica nigrescens*
Townsend's Warbler	*Dendroica townsendi*
Townsend's x Hermit Warbler Hybrid	*Dendroica townsendi x occidentalis*
Hermit Warbler	*Dendroica occidentalis*
MacGillivray's Warbler	*Oporornis tolmiei*
Common Yellowthroat	*Geothlypis trichas*
Wilson's Warbler	*Wilsonia pusilla*
Western Tanager	*Piranga ludoviciana*
Spotted Towhee	*Pipilo maculatus*
Chipping Sparrow	*Spizella passerina*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia*
Lincoln's Sparrow	*Melospiza lincolnii*
White-crowned Sparrow	*Zonotrichia leucophrys*
Dark-eyed Junco	*Junco hymenalis*

Appendix A. Scientific Names of All Bird Species Listed in this Report (continued).

Common Name	Scientific Name[1]
Black-headed Grosbeak	*Pheucticus melanocephalus*
Red-winged Blackbird	*Agelaius phoeniceus*
Brown-headed Cowbird	*Molothrus ater*
Gray-crowned Rosy-Finch	*Leucosticte tephrocotis*
Pine Grosbeak	*Pinicola enucleator*
Cassin's Finch	*Carpodacus cassinii*
Red Crossbill	*Loxia curvirostra*
Pine Siskin	*Carduelis pinus*
American Goldfinch	*Carduelis tristis*
Evening Grosbeak	*Coccothraustes vespertinus*

[1]Names follow American Ornithologists' Union (1998).

Appendix B. Scientific Names of All Plant Species Listed in this Report

Common Name	Scientific Name[1]
Pacific Silver Fir	*Abies amabalis*
Grand Fir	*Abies grandis*
Subalpine Fir	*Abies lasiocarpa*
Noble Fir	*Abies procera*
Red Alder	*Alnus rubra*
Alaska Yellow Cedar	*Chamaecyparis nootkatensis*
Engelmann Spruce	*Picea engelmannii*
Douglas Fir	*Pseudotsuga menzeisii*
Western Redcedar	*Thuja plicata*
Western Hemlock	*Tsuga heterophylla*
Mountain Hemlock	*Tsuga mertensiana*

[1]Names follow Pojar and Mackinnon (1994).

Appendix C. Metadata for the Avian Inventory of Mount Rainier National Park

The accompanying CD contains the MS Access file IBP_DATA containing five access tables: ibp_pct, ibp_vega, ibp_vegb, ibp_rare, and ibp_density. This appendix serves as metadata for these files. Note that tables referred to in the field descriptions below are presented at the end of the appendix.

1. Point count data: ibp_pct

This file contains all point count data from both the 2003 and 2004 field seasons.

Field: LOC
Description: Identifies the park, MORA = Mount Rainier National Park.

Field: DATE
Description: The date the point count was conducted (mm/dd/yyyy).

Field: TRANSECT
Description: Identifies transect on which the point was conducted.

Field: POINT
Description: Identifies the point number along the transect.

Field: UNIQPT
Description: Combines transect and 2-digit point number along the transect for each point conducted, providing a unique code for each point. For example, the second point on Transect 2051 would be 205102. **This field may be used to link data in each of the databases on this disk.**

Field: HAB
Description: Signifies the bird classification habitat type. See Table A1 for a list of habitats and their codes.

Field: HABGROUP
Description: Signifies the habitat group the point was placed in for fitting the species-specific detectability functions in Distance. 'Dense' signifies low- and mid-elevation forest; 'sparse' signifies open habitats as well as high-elevation forest.

Field: BIRDOBS
Description: Initials of the point count observer. See Table A5 for full list of observer names.

Field: NOISE
Description: Noise interference, scored from 1 to 5, where 1 = no noise, 2=*gentle babbling brook noise,* probably not missing birds; 3=*babbling creek noise*, might be missing some high-pitched songs/calls of distant birds; 4=*rushing creek noise*, detection radius is probably

substantially reduced; 5=*roaring creek/river noise*, probably detecting only the closest/loudest birds.

Field: TIME
Description: 4-character field indicating the time of day the point count began.

Field: SPEC
Description: 4-character bird species code. See Table A2 for bird species codes.

Field: COMMONNAME
Description: Common name of species coded in SPEC field.

Field: DIST
Description: Horizontal distance in meters to a bird when it was first detected.

Field: PREV
Description: An 'X' indicates that the same individual was recorded on at least two consecutive points counts. The record with the 'X' indicates the point at which the detected individual was at a greater distance from the observer.

Field: FLY
Description: Indicates the number of birds detected as flyovers.

Field: SEENFIRST
Description: 'Y' indicates the distance to the bird was estimated *after* visually locating the bird. 'N' indicates the distance to the bird was estimated without the use of visual cues.

Field: EVERSANG
Description: 'Y' indicates the bird sang at least once during the five-minute point count. 'N' indicates the bird did not sing during the five-minute point count.

Field: Interval
Description: '3' indicates the bird was first detected in the first three minutes of the five-minute point count period. '2' indicates the bird was first detected in the last two minutes of the five-minute point count period.

Field: Flock
Description: Indicates multiple birds in a flock. A blank field indicates a single individual.

2. Habitat Data I: ibp_vega

This is one of two files containing habitat data from each of the point count stations visited during the 2003 and 2004 field seasons. Ibp_vega.xls contains data that pertain to the entire vegetation plot, as well as to one of the two intensively sampled subplots (subplot 'A'). Note that some of the *Vaccinium* species can be difficult to identify to species, especially in the late

spring/early summer. Data fields indicate our crew members' best attempt to identify the correct species, but some errors may have occurred.

Field: TRANSECT
Description: Identifies transect on which the point was conducted.

Field: POINT
Description: Identifies the point number along the transect.

Field: UNIQPT
Description: Combines transect and the point for each point conducted, providing a unique code for each point. **This field may be used to link data in each of the databases on this disk.**

Field: TRAIL
Description: Identifies the sample point as either on trail or off trail. 'ON' indicates a point sampled on-trial. 'OFF' indicates a point samples off trail.

Field: HAB
Description: 4-character code identifying the dominant habitat type (for the most part PMR-based) within a 50-m radius of the survey point. See Table A1 for list of habitat codes.

Field: HABNAME
Description: Complete name of each habitat type. See Table A1 for the complete list of habitat names and codes.

Field: HAB2
Description: 4-character code identifying a secondary habitat type (if present) within a 50-m radius of the survey point. See Table A1 for list of habitat codes.

Field: HAB2NAME
Description: Complete name of habitat indicated in HAB2.

Field: DATE
Description: The date the vegetation was sampled (mm/dd/yyyy).

Field: BIRDOBS
Description: Initials of the point count observer. See Table A5 for full list of observer names.

Field: VEGOBS
Description: Initials of the vegetation observer. See Table A5 for full list of observer names.

Field: ASPECT
Description: Compass degrees indicating the dominant aspect of the 50-m radius point count circle.

Field: ELEV_FT

Description: Elevation in feet, as determined by observers from topographic maps in the field.

Field: SLOPE
Description: Average slope (degrees) of the 50-m radius point count circle, measured with a clinometer. **'99' indicates no data were collected in the field.**

Field: ROCKPRES
Description: Y=exposed rock is a substantial enough feature of the habitat to affect bird usage of the area, N=little or no exposed rock.

Field: MOIST
Description: Soil moisture in the 50-m radius circle. 1=dry, 2=moist, 3=wet.

Field: STANDH20
Description: Area (square meters) of the 50-m radius circle covered in standing water.

Field: RUNH20
Description: Index describing running water in the 50-m radius circle. 1=none, 2=trickle, 3=small stream, 4=large stream, 5=river.

Field: LOCSOURCE
Description: Indicates the primary method used to obtain the GPS coordinates in the field: G = GPS unit and map (low-cost Garmin GPS models used), M = MAP only, GPS Unit and map.

Field: NORTHING
Description: UTM northing (NAD27) of the survey point.

Field: EASTING
Description: UTM easting (NAD27) of the survey point.

Field: GPSERROR
Description: Error in meters of GPS reading, as provided by hand-held GPS unit.

Field: FRANKKEY
Description: 1-letter code indicating the letter of the Franklin Key used in classifying the Franklin Key species.

Field: DOMTREE
Description: 6-letter code (first 3 letters of genus followed by first 3 letters of species) of the dominant tree species present in plot. See Table A3 for complete tree species list.

Field: DOMSHRUB1
Description: 6-letter code (first 3 letters of genus followed by first 3 letters of species) of the dominant shrub species present in plot. See Table A4 for complete shrub species list.

Field: DOMSHRUB2

Description: 6-letter code (first 3 letters of genus followed by first 3 letters of species) of the second most dominant shrub species present in plot. See Table A4 for complete shrub species list.

Field: OTHERHAB1
Description: 4-character code indicating the presence of other habitat types outside of the 50-m radius circle but within 100 m of the center of the vegetation plot. See Table A1 for list of habitat names.

Field: OTHERHAB2
Description: 4-character code entered indicating the presence of other habitat types outside of the 50-m radius circle but within 100 m of the center of the vegetation plot. See Table A1 for list of habitat names.

The following fields, all of which begin with 'A' describe conditions in the first of two 20m x 40m subplots adjacent to the point count station.

Field: APLOTHAB
Description: 4-character code identifying the dominant habitat type within the subplot. See Table A1 for list of habitat codes.

Field: AHABNAME
Description: Complete name of each habitat type. See Table A1 for the complete list of habitat names and codes.

Field: AHERBCAN
Description: Average height (cm) of the herbaceous canopy, if present.

Field: ATREECAN
Description: Average height (m) of the tree canopy, if present.

Field: ATREESCAN
Description: Average height (m) of the tree subcanopy, if present.

Field: ASHRUBCAN
Description: Average height (m) of the shrub canopy, if present.

Field: ASHRUBSCAN
Description: Average height (m) of the shrub subcanopy, if present.

Field: ATREE1ID
Description: 6-letter code (first 3 letters of genus followed by first 3 letters of species) of a plant species covering at least 1% of the subplot, at least 5m above ground. See Table A3 for list of tree codes.

Field: AT1NAME

Description: Indicates the common name of the code entered in ATREE1ID. See Table A3 for list of tree common names.

Field: ATREE123
Description: Count of stems 1-23cm dbh of the species indicated in Atree1id.

Field: ATREE153
Description: Count of stems 24-53cm dbh of the species indicated in Atree1id.

Field: ATREE181
Description: Count of stems 54-81cm dbh of the species indicated in Atree1id.

Field: ATREE1122
Description: Count of stems 82-122cm dbh of the species indicated in Atree1id.

Field: ATREE1123
Description: Count of stems >122cm dbh of the species listed in Atree1id.

Field: ATREE1HCOV
Description: Percent cover of the species indicated in Atree1id, considering only vegetation greater than 20 m above ground.

Field: ATREE1MCOV
Description: Percent cover of the species indicated in Atree1id, considering only vegetation between 5 and 20 m above ground.

Field: ATREE2ID
Description: 6-letter code (first 3 letters of genus followed by first 3 letters of species) of another plant species covering at least 1% of the subplot, at least 5m above ground. See Table A3 for list of tree codes.

Field: AT2NAME
Description: Indicates the common name of the code entered in ATREE2ID. See Table 3 for list of tree common names.

Fields: ATREE223… ATREE2MCOV
Description: Fields follow the same conventions as above, but applied to the species indicated in Atree2id, rather than Atree1id.

Fields following the same conventions are provided for four additional plant species (Atree3id…Atree6id).

Field: ASHRUBHCOV
Description: Percent cover of the all shrub species (undifferentiated) in the vegetation layer greater than 20 m above ground.

Field: ASHRUBMCOV
Description: Percent cover of the all shrub species (undifferentiated) in the vegetation layer between 5-20 m above ground.

Field: ASNAG23
Description: Number of snags (dead tree, any species, >1.5 m tall) 1-23 cm dbh.

Field: ASNAG53
Description: Number of snags 24-53 cm dbh.

Field: ASNAG81
Description: Number of snags 54-81 cm dbh.

Field: ASNAG122
Description: Number of snags 82-122 cm dbh.

Field: ASNAG123
Description: Number of snags >122 cm dbh.

Field: ADECAY1
Description: Number of logs (>20 cm diameter) crossing the center of the plot, perpendicular to its long axis (such that the observer had to step or climb over them) of decay class 1. Decay classes were defined as follows:

Characteristic	Decay Class 1	Decay Class 2	Decay Class 3
Bark	Mostly intact	Mostly sloughed/sloughing	Absent
3 cm twigs	Present to absent	Absent	Absent
Exposed wood texture	Intact, hard	Large pieces, partly soft	Small pieces, soft
Portion of log on ground	Log supporting itself	Log sagging on ground	Log entirely grounded
Exposed wood color	Original	Original to reddish	Reddish to brown
Epiphytes	None	Conifer seedlings	Moss and conif. sdlng
Invading roots	None	Shallow seedlings	Roots penetrating
Log x-sectional shape	Round	Round	Oval or collapsed

Field: ADECAY2
Description: Number of logs (>20 cm diameter) crossing the center of the plot, perpendicular to its long axis (such that the observer had to step or climb over them) of decay class 2.

Field: ADECAY3
Description: Number of logs (>20 cm diameter) crossing the center of the plot, perpendicular to its long axis (such that the observer had to step or climb over them) of decay class 3.

Field: ATOTCOVH
Description: Percent cover of all contributing species, considering only vegetation greater than 20 m above ground.

Field: ATOTCOVM
Description: Percent cover of all contributing species, considering only vegetation between 5 and 20 m above ground.

Field: AWVTOTCOV
Description: Percent cover of all contributing species (tree or shrub), considering only vegetation between 1 and 5 m above ground.

Field: ASHRUBONLY
Description: Percent cover of all shrub species, considering only vegetation between 1 and 5 m above ground.

Field: AWV1ID
Description: 6-letter code (first 3 letters of genus followed by first 3 letters of species) of a plant species covering at least 1% of the subplot, considering only vegetation between 1 and 5 m above ground. See Table A4 for shrub species list.

Field: AWV1NAME
Description: Indicates the common name of the species entered in AWV1ID. See Table A4 for list of shrub common names and codes.

Field: AWV1COV
Description: Considering only vegetation between 1 and 5 m above ground, percent cover of species indicated in Awv1id.

Field: AWV1HT
Description: Avg. ht (m) of species indicated in Awv1id.

Fields following the same conventions are provided for 6 more plant species (AWV2ID-AWV2HT; AWV3ID-AWV3HT;…AWV7ID-AWV7HT).

Field: AWVTREESCO
Description: Considering only vegetation between 1 and 5 m above ground, percent cover of all tree species (undifferentiated) present.

The following fields all refer to ground cover below 0.1 m above ground.

Field: ASNOW
Description: Percent of ground covered by snow.

Field: AWATER
Description: Percent of ground covered by standing or running water.

Field: AROCK
Description: Percent of ground comprised of exposed rock.

Field: ABARE
Description: Percent of ground comprised of bare soil.

Field: ALITTER
Description: Percent of ground covered by organic litter.

Field: ADW
Description: Percent of ground covered by downed wood.

Field: AGRASS
Description: Percent of ground covered by grass.

Field: ASEDGE
Description: Percent of ground covered by sedge.

Field: AFORB
Description: Percent of ground covered by forbs.

Field: AFERN
Description: Percent of ground covered by ferns.

Field: ASHRUB
Description: Percent of ground covered by shrubs.

Field: ATREE
Description: Percent of ground covered by tree foliage.

Field: AMOSS
Description: Percent of ground covered by moss.

Field: AOTHER1ID
Description: One-word description of any additional ground cover item.

Field: AOTHER1COV
Description: Percent of ground covered by item indicated in Aother1id.

Field: AOTHER2ID
Description: One-word description of any additional ground cover item.

Field: AOTHER2COV
Description: Percent of ground covered by item indicated in Aother1id

Field: ACOMPLETE
Description: 'Y' indicates all data for the subplot were collected. 'N' indicates some data for the subplot were missing.

Field: ADESCRIBE
Description: Describes data missing in subplot for records with an 'N' in Acomplete.

Field: DENNORTH
Description: Number of open vertices (out of 96 possible) on the spherical densiometer face, when the observer was facing north. **999 signifies no data were collected.**
Field: DENEAST
Description: Number of open vertices (out of 96 possible) on the spherical densiometer face, when the observer was facing east. **999 signifies no data were collected.**

Field: DENSOUTH
Description: Number of open vertices (out of 96 possible) on the spherical densiometer face, when the observer was facing south. **999 signifies no data were collected.**

Field: DENWEST
Description: Number of open vertices (out of 96 possible) on the spherical densiometer face, when the observer was facing west. **999 signifies no data were collected.**

3. Habitat Data II: ibp_vegb

The file ibp_vegb.xls contains data pertaining to the second of the two vegetation subplots (subplot 'B') associated with each point count station. The first field, 'UNIQPT' serves as a link to each of the other databases. The remaining fields are identical to their counterparts in ibp_vega.xls, except they all begin with 'B'.

4. Rare Bird Data: ibp_rare

This file contains documentation of notable, unexpected, or otherwise poorly documented species that our crews detected in the park at times other than during point counts.

Field: SPEC
Description: 4-character bird species code. See Table A2 for key to bird species codes.

Field: COMMONNAME
Description: Common name of species coded in SPEC field.

Field: OBSERVER
Description: Initials of the rare bird observer. MOB = Many Observers; see Table A6 for all other observer names.

Field: DATE
Description: The date the bird was observed (mm/dd/yyyy).

Field: QUANTITY

Description: The number of birds detected of the indicated species.

Field: NORTHING
Description: UTM northing (NAD27) of the detection.

Field: EASTING
Description: UTM easting (NAD27) of the detection.

Field: DETAILS
Description: Details regarding encounter and identification of species.

4. Species- and habitat-specific density estimates: ibp_density

This file contains habitat-specific density estimates and associated information for all species detected during point counts.

Field: HAB
Description: 4-letter habitat code. See Table A1 for a list of habitats and their codes.

Field: HABNAME
Description: Complete name of each habitat type. See Table A1 for the complete list of habitat names and codes.

Field: SPEC
Description: 4-character bird species code. See Table A2 for bird species codes.

Field: COMMONNAME
Description: Common name of species coded in SPEC field.

Field: PRCNTWUNLD
Description: Percent of points in the indicated habitat at which the species was detected.

Field: PTSWUNLDET
Description: Number of points at which the species was detected (includes flyovers).

Field: ALLDETS:
Description: Number of individual detections of indicated species in indicated habitat, excluding flyovers.

Field: L50DETS:
Description: Number of less than 50-m radius individual detections of indicated species in indicated habitat, excluding flyovers.

Field: UNADJDENS
Description: Unadjusted density, based on the number of detections within 50 m of the observer, **with no adjustment for detectability.**

Field: ADJDENS
Description: Adjusted density, calculated using Distance 4.0 Release 2.

Field: PERCENTCV
Description: Coefficient of variation of the density estimate, expressed as a percentage.

Field: DF
Description: Degrees of freedom of the density estimate.

Field: LOW95CI
Description: Lower bound of the 95% confidence interval of the density estimate.

Field: HIGH95CI
Description: Upper bound of the 95% confidence interval of the density estimate.

Table A1. Habitats and codes in the databases. Asterisks indicate habitats used for which we estimated bird density.

Habitat	Code
Alaska Yellow Cedar*	ALYC
Big Leaf Maple	BIGM
Conifer Deciduous Mix*	CODM
Developed	DEVO
Douglas-fir*	DOFI
Engelmann Spruce*	ENGS
Grand Fir*	GRAF
Heather	HEAT
Heather/Herbaceous Sedge Meadow*	HHSM
Herbaceous Sedge	HESE
High-elevation Shrub*	HSHR
Meadow	MEAD
Mid-elevation Shrub*	MSHR
Mixed Conifer	MICO
Mixed Douglas-fir/Western Hemlock*	DFWH
Mountain Hemlock*	MOHE
Noble Fir*	NOBF
Pacific Silver Fir*	PASF
Red Alder*	REAL
Road	ROAD
Rock or Sparsely Vegetated*	ROSV
Shrub	SHRU
Sitka Spruce	SISP
Snow	SNOW
Subalpine fir*	SUBF
Water	WATE
Western Hemlock*	WEHE
Western Redcedar*	WERC

Table A2. Bird species codes used in the databases.

Common Name	Code	Common Name	Code
American Crow	AMCR	Hutton's Vireo	HUVI
American Dipper	AMDI	Lincoln's Sparrow	LISP
American Goldfinch	AMGO	MacGillivray's Warbler	MGWA
American Kestrel	MAKE	Mallard	MALL
American Pipit	AMPI	Marbled Murrelet	MAMU
American Robin	AMRO	Merlin	MERL
Band-tailed Pigeon	BTPI	Mountain Bluebird	MOBL
Barn Swallow	BARS	Mountain Chickadee	MOCH
Barred Owl	BDOW	Northern Flicker	NOFL
Belted Kingfisher	BEKI	Northern Goshawk	NOGO
Black Swift	BLSW	Northern Harrier	NOHA
Black-headed Grosbeak	BHGR	Northern Pygmy-Owl	NOPO
Black-throated Gray Warbler	BTYW	Olive-sided Flycatcher	OSFL
Blue Grouse	BLUG	Orange-crowned Warbler	OCWA
Brown Creeper	BRCR	Osprey	OSPR
Brown-headed Cowbird	BHCO	Pacific-slope Flycatcher	PSFL
Bushtit	BUSH	Pileated Woodpecker	PIWO
Canada Goose	CAGO	Pine Grosbeak	PIGR
Canyon Wren	CANW	Pine Siskin	PISI
Cassin's Finch	CAFI	Red Crossbill	RECR
Cedar Waxwing	CEDW	Red-breasted Nuthatch	RBNU
Chestnut-backed Chickadee	CBCH	Red-breasted Sapsucker	RBSA
Chipping Sparrow	CHSP	Red-tailed Hawk	RTHA
Clark's Nutcracker	CLNU	Red-winged Blackbird	RWBL
Common Nighthawk	CONI	Rough-legged Hawk	RLHA
Common Raven	CORA	Ruby-crowned Kinglet	RCKI
Common Yellowthroat	COYE	Rufous Hummingbird	RUHU
Dark-eyed Junco	DEJU	Sharp-shinned Hawk	SSHA
Downy Woodpecker	DOWO	Song Sparrow	SOSP
Dusky Flycatcher	DUFL	Spotted Sandpiper	SPSA
Evening Grosbeak	EVGR	Spotted Towhee	SPTO
Fox Sparrow	FOSP	Steller's Jay	STJA
Golden Eagle	GOEA	Swainson's Thrush	SWTH
Golden-crowned Kinglet	GCKI	Three-toed Woodpecker	TTWO
Gray Jay	GRAJ	Townsend's Solitaire	TOSO
Gray-crowned Rosy-Finch	GCRF	Townsend's Warbler	TOWA
Great Blue Heron	GBHE	Townsend's x Hermit Warbler Hybrid	THWH
Great Horned Owl	GHOW	Tree Swallow	TRES
Hairy Woodpecker	HAWO	Turkey Vulture	TUVU
Hammond's Flycatcher	HAFL	Unidentified Empidonax	UNEM
Harlequin Duck	HARD	Unidentified Flycatcher	UNFL
Hermit Thrush	HETH	Unidentified Hummingbird	UNHU
Hermit Warbler	HEWA	Unidentified Sapsucker	UNSA

Table A2. Bird species codes used in the databases (continued).

Common Name	Code	Common Name	Code
Unidentified Swallow	UNSW	Western Tanager	WETA
Unidentified Warbler	UNWA	Western Wood-Pewee	WEWP
Unidentified Woodpecker	UNWO	White-crowned Sparrow	WCSP
Varied Thrush	VATH	White-tailed Ptarmigan	WTPT
Vaux's Swift	VASW	Wilson's Warbler	WIWA
Violet-green Swallow	VGSW	Winter Wren	WIWR
Warbling Vireo	WAVI	Yellow Warbler	YWAR
Western Screech-Owl	WESO	Yellow-rumped Warbler	YRWA

Table A3. Tree species codes used in the databases.

Common Name	Scientific Name[1]	Code
Pacific Silver Fir	*Abies amabalis*	ABIAMA
Grand Fir	*Abies grandis*	ABIGRA
Subalpine Fir	*Abies lasiocarpa*	ABILAS
Noble Fir	*Abies procera*	ABIPRO
Unknown Fir	*Abies sp.*	ABISP
Vine Maple	*Acer circinatum*	ACECIR
Mountain Maple	*Acer glabrum*	ACEGLA
Big-leaf Maple	*Acer macro*	ACEMAC
Red Alder	*Alnus rubra*	ALNRUB
Sitka Alder	*Alnus sinuata*	ALNSIN
Bog Birch	*Betula glandulosa*	BETGLA
Paper Birch	*Betula papyifera*	BETPAP
Alaska Yellow Cedar	*Chamaecyparis nootkatensis*	CHANOO
Pacific Dogwood	*Cornus nuttallii*	CORNUT
Common Juniper	*Juniperus communis*	JUNCOM
Engelmann Spruce	*Picea engelmannii*	PICENG
Sitka Spruce	*Picea sitchensis*	PICSIT
Whitebark Pine	*Pinus albicaulis*	PINALB
Lodgepole Pine	*Pinus contorta*	PINCON
Western White Pine	*Pinus monticola*	PINMON
Ponderosa Pine	*Pinus pondonderosa*	PINPON
Black Cottonwood	*Populus balsamifera*	POPBAL
Quaking Aspen	*Populus trichocarpa*	POPTRE
Douglas Fir	*Pseudotsuga menzeisii*	PSEMEN
Western Yew	*Taxus brevifolia*	TAXBRE
Western Redcedar	*Thuja plicata*	THUPLI
Western Hemlock	*Tsuga heterophylla*	TSUHET
Mountain Hemlock	*Tsuga mertensiana*	TSUMER

[1]Scientific names follow Pojar and Mackinnon (1994) and/or Biek (2000).

Table A4. Plant species codes used in the databases.

Common Name	Scientific Name[1]	Code
Vine Maple	*Acer circinatum*	ACECIR
Dwarf Maple	*Acer glabrum*	ACEGLA
Mountain Maple	*Acer glabrum*	ACEGLA
Big Leaf Maple	*Acer macrophyllum*	ACEMAC
Red Alder	*Alnus rubra*	ALNRUB
Slide Alder	*Alnus viridis*	ALNVIR
Serviceberry	*Amelanchier alnifolia*	AMEALN
Unknown Anemone	*Anemone sp.*	ANESP
Kinnikinnick	*Arctostaphylos uva-ursi*	ARCUVA
Tall Oregon Grape	*Berberis aquifolium*	BERAQU
Cascade Oregon Grape	*Berberis nervosa*	BERNER
Creeping Oregon Grape	*Berberis ripens*	BERRIP
Unknown Oregon Grape	*Berberis sp.*	BERSP
Deer Fern	*Blechnum spicant*	BLESPI
White Mountain Heather	*Cassiope mertensiana*	CASMER
Alaskan Mountain Heather	*Cassiope stelleriana*	CASSTE
Mountain Balm	*Ceanothus velutinus*	CEAVEL
Pipsissewa	*Chimaphila umbellata*	CHIUMB
Bunchberry	*Cornus Canadensis*	CORCAN
Red-Oiser Dogwood	*Cornus sericea*	CORSER
Unknown Dogwood	*Cornus sp.*	CORSP
Hazelnut	*Corylus cornuta*	CORCOR
Slender Wintergreen	*Gaultheria ovatifolia*	GAUOVA
Salal	*Gaultheria shallon*	GAUSHA
Ocean Spray	*Holodiscus discolor*	HOLDIS
Juniper	*Juniperus communis*	JUNCOM
Bog Laurel	*Kalmia microphylla*	KALMIC
Trapper's Tea	*Ledum glandulosum*	LEDGLA
Labrador Tea	*Ledum groenlandicum*	LEDGRO
Twinflower	*Linnaea borealis*	LINBOR
Twinberry	*Lonicera involucrate*	LONINV
Unknown Lupine	*Lupinus s.*	LUPSP
False Solomon's Seal	*Maianthemum racemosum*	MAIRAC
False Azalea	*Menziesia ferruginea*	MENFER
Sweet Gale	*Myrica gale*	MYRGAL
Indian Plum	*Oemleria cerasiformis*	OEMCER
Devil's Club	*Oplopanax horridum*	OPLHOR
Mountain Box	*Pachistima myrsinites*	PACMYR
Pink Mountain Heather	*Phyllodoce empetriformis*	PHYEMP
Yellow Mountain Heather	*Phyllodoce glanduliflora*	PHYGLA
Unknown Heather	*Phyllodoce sp.*	PHYSP
Western Sword Fern	*Polystichium munitum*	POLMUN
Bitter Cherry	*Prunus emarginata*	PRUEMA

Table A4. Plant species codes used in the databases (continued).

Common Name	Scientific Name[1]	Code
Cascara	*Rhamnus purshiana*	RHAPUR
White Rhododendron	*Rhododendron albiflorum*	RHOALB
Pacific Rhododendron	*Rhododendron macrophyllum*	RHOMAC
Stink Currant	*Ribes bracteosum*	RIBBRA
Swamp Gooseberry	*Ribes lacustre*	RIBLAC
Trailing Black Currant	*Ribes laxiflorum*	RIBLAX
Red-flowering Current	*Ribes sanguineum*	RIBSAN
Unknown Ribes	*Ribes sp.*	RIBSP
> 1 Unknown Ribes	*Ribes spp.*	RIBSPP
Sticky Currant	*Ribes viscosissimum*	RIBVIS
Wood Rose	*Rosa gymnocarpa*	ROSGYM
Unknown Rose	*Rose sp.*	ROSSP
Dwarf Blackberry	*Rubus lasiococcus*	RUBLAS
Western Thimbleberry	*Rubus parviflorus*	RUBPAR
Five-leaved Blackberry	*Rubus pedatus*	RUBPED
Unknown Rubus	*Rubus sp.*	RUBSP
Salmonberry	*Rubus spectabilis*	RUBSPE
> 1 Unknown Rubus	*Rubus spp.*	RUBSPP
Pacific Blackberry	*Rubus ursinus*	RUBURS
Shining Willow	*Salix lucida*	SALLUC
Sitka Willow	*Salix sitchensis*	SALSIT
Unknown Willow	*Salix sp.*	SALSP
> 1 Unknown Willow	*Salix spp.*	SALSPP
Blue Elderberry	*Sambucus cerulea*	SAMCER
Red Elderberry	*Sambucus racemosa*	SAMRAC
Cascade Mountain Ash	*Sorbus scopulina*	SORSCO
Sitka Mountain Ash	*Sorbus sitchensis*	SORSIT
Birch-leaved Spirea	*Spirea betulifolia*	SPIBET
Subalpine Spirea	*Spirea densiflora*	SPIDEN
Douglass's Spirea	*Spirea douglasii*	SPIDOU
Unknown Spirea	*Spirea sp.*	SPISP
Common Snowberry	*Symphoricarpos albus*	SYMALB
Unknown Snowberry	*Symphoricarpos sp.*	SYMSP.
Western Yew	*Taxus brevifolia*	TAXBRE
Alaska Huckleberry	*Vaccinium alaskense*	VACALA
Blue-leaf Huckleberry	*Vaccinium deliciosum*	VACDEL
Thin-leaved Huckleberry	*Vaccinium membranaceum*	VACMEM
Oval-leaf Huckleberry	*Vaccinium ovalifolium*	VACOVA
Red Huckleberry	*Vaccinium parvifolium*	VACPAR
Grouseberry	*Vaccinium scoparium*	VACSCO
Blueberry/Huckleberry	*Vaccinium sp.*	VACSP
Unknown Huckleberry	*Vaccinium sp.*	VACSP
>1 Unknown Huckleberry	*Vaccinium spp.*	VACSPP

Table A4. Plant species codes used in the databases (continued).

Common Name	Scientific Name[1]	Code
Bear Grass	*Xerophyllum tenax*	XERTEN
Unknown Forb		FORB
Unknown Plant		UNKNOW
Unknown Fern		FERN

[1]Scientific names follow Pojar and Mackinnon (1994) and/or Biek (2000).

Table A5. Field observers' names and initials.

Name	Initials
Amy Brown	AB
Angie Kociolek	AK
Bob Wilkerson	BW
Eric Michelson	EM
Heidi Pedersen	HP
Katie Stassen	KS
Mandy Holmgren	MH
Roberto Quintero	RQ
Rodney Siegel	RS
Ryan Kepler	RK

Appendix D. Field Forms

Mount Rainier National Park 2004 VCP Point Count Form page____of_____

Transect_________ Date____/____/____ Observer______ Weather____

Starting Northing	☐☐☐☐☐☐☐
Starting Easting	☐☐☐☐☐☐

Starting Direction:______ Offset (Y, N):____

Ending Northing	☐☐☐☐☐☐☐
Ending Easting	☐☐☐☐☐☐

Protocol (**n**ormal, **r**estrict. hab, **t**rail, **m**ixed—on & offtrail, **d**eliberate):______

TURNS	
Pt. #	New Dir.

Notes:

____

____

Pt	N[1]	Start Time	Species	Dist.	Flyover (count)	Seen First	Ever Sang	I[2]

Pt	N[1]	Start Time	Species	Dist.	Flyover (count)	Seen First	Ever Sang	I[2]

[1]Noise: 1=*no noise*; 2=*gentle babbling brook noise*, probably not missing birds; 3=*babbling creek noise*, might be missing some high-pitched songs/calls of distant birds; 4=*rushing creek noise*, detection radius is probably substantially reduced; 5=*roaring creek/river noise*, probably detecting only the closest/loudest birds.
[2]Interval: 3=first detected during first three minutes of point count; 2=first detected during last two minutes of point count.

Mount Rainier National Park Point Count Vegetation Sheet

Point:_____ Hab:_____ Hab2 (optional):_____ Date:___/___/___ Bird Obs:_____ Veg Obs:_____ Aspect (°):_____

Slope(°):_____ Rock (y or n):_____ Moisture (1-3):____ Std H_2O (sq.-m):_____ Run H_2O (1-5):____ Elev:_____(___ft ___m)

Location Source:____(G, M) Northing: __ __ __ __ __ __ __ Easting: __ __ __ __ __ __ GPS error:_____(m) **NAD 27 DATUM**

Franklin Key Used:_____ Dom Tree: _____ Dom Shrub:_____ Other Habs W/in. 100 m:_____, _____

Plot 1 Habitat:_____ Avg. tree canopy ht.:_____m Avg. shrub canopy ht.:_____m

Avg. herb canopy ht.:_____cm Avg. tree sub-canopy ht.:_____m Avg. shrub sub-canopy ht.:_____m

Tree Species	0-23 cm	24-53 cm	54-81 cm	82-122 cm	>122 cm	Cov > 20 m	Cov 5-20 m
						%	%
						%	%
						%	%
						%	%
						%	%
						%	%
SHRUBS						%	%
Snags (>1.5m tall)							
Logs > 20cm DBH	Decay =1		Decay=2		Decay=3	**Total Cover**	%	%

Woody Vegetation between 0.1 m and 5.0 m

Total Cover:_____% Shrub Cover Only:_____%

Species	Cover	Avg. Ht. (m)
	%	
	%	
	%	
	%	
	%	
	%	
	%	
TREES	%	

Ground cover (0.1 m or less)

Type	Cover	Type	Cover
snow	%	fern	%
water	%	shrub	%
rock	%	tree	%
bare dirt/mud	%	moss	%
litter	%	Other 1:	%
downed wood	%	Other 2:	%
grass	%	Other 3:	%
sedge	%	Other 4:	%
forb	%		

Plot 2 Habitat:_____ Avg. tree canopy ht.:_____m Avg. shrub canopy ht.:_____m

Avg. herb canopy ht.:_____cm Avg. tree sub-canopy ht.:_____m Avg. shrub sub-canopy ht.:_____m

Tree Species	0-23 cm	24-53 cm	54-81 cm	82-122 cm	>122 cm	Cov > 20 m	Cov 5-20 m
						%	%
						%	%
						%	%
						%	%
						%	%
						%	%
SHRUBS						%	%
Snags (>1.5m tall)							
Logs > 20cm DBH	Decay =1		Decay=2		Decay=3	**Total Cover**	%	%

Woody Vegetation between 0.1 m and 5.0 m

Total Cover:_____% Shrub Cover Only:_____%

Species	Cover	Avg. Ht. (m)
	%	
	%	
	%	
	%	
	%	
	%	
	%	
TREES	%	

Ground cover (0.1 m or less)

Type	Cover	Type	Cover
snow	%	fern	%
water	%	shrub	%
rock	%	tree	%
bare dirt/mud	%	moss	%
litter	%	Other 1:	%
downed wood	%	Other 2:	%
grass	%	Other 3:	%
sedge	%	Other 4:	%
forb	%		

Mount Rainier National Park Point Count Densiometer Readings

Transect:_____ Date:_____ Observer:_____

Note: Please record the number of OPEN quarter-squares!!!

Point 1			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 2			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 3			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 4			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 5			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 6			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 7			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 8			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 9			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 10			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 11			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 12			
North: _____/96	East: _____/96	South: _____/96	West: _____/96
Point 13			
North: _____/96	East: _____/96	South: _____/96	West: _____/96

Mt. Rainier National Park Inventory Rare Bird Report Form

Obs.:	Species:	Date: / /2004	Qty:	Northing: __ __ __ __ __ __ __	Easting: __ __ __ __ __ __	Time:
Transect and point, if detected during a point count:						
Description (include diagnostic plumage and vocalization details used to identify the individual, sex, #'s, and any nest sightings or behavior indicative of nesting):						

Obs.:	Species:	Date: / /2004	Qty:	Northing: __ __ __ __ __ __ __	Easting: __ __ __ __ __ __	Time:
Transect and point, if detected during a point count:						
Description (include diagnostic plumage and vocalization details used to identify the individual, sex, #'s, and any nest or behavior indicative of nesting):						

Hitlist:
COLO
All Grebe spp.
All Waterfowl
Scoter spp.
Merganser spp.
MAMU
TUVU
OSPR
BAEA
NOHA
SSHA, COHA
NOGO, RTHA
GOEA
MAKE, MERL
PEFA
RNPH
SPGR
WTPT
All Quail Spp.
VIRA
Shorebird spp.
All Gull spp.
MAMU
BTPI, MODU
All Owl spp.
CONI, ANHU
All Swift Spp.
BEKI
LEWO, WISA
RNSA, TTWO
BBWO
WIFL, DUFL
WEWP, WEKI
WESJ, CLNU
HOLA
All Swallows
REVI
WBNU
CANW, ROWR
HOWR, MAWR
RCKI
WEBL, MOBL
TOSO, NOMO
AMPI, EUST
CEDW, GRCA
NAWA, HEWA
AMRE, COYE
VESP, SAVS
FOSP, LISP
GCSP, LAZB
WEME, YHBL
BUOR, RWBL
BRBL, BHCO
GCRF, PIGR
PUFI, CAFI
WWCR, AMGO

Or anything you even suspect may be unusual or outside its normal range.

MOUNT RAINIER NATIONAL PARK BIRD INVENTORY DAILY JOURNAL

Transect:_____ Quad:_____ Date:_____/____/_____ Bird Obs.:_____ Veg. Obs.:_____

Transect Turning Points

Point number:_____ New direction:_____

Explanation:_____

_____

Point number:_____ New direction:_____

Explanation:_____

_____

Point number:_____ New direction:_____

Explanation:_____

_____

Point number:_____ New direction:_____

Explanation:_____

_____

Transect notes (describe transect route including crossing creeks/rivers and vegetation types encountered):

_____

_____

_____

_____

_____

Weather:_____

_____

_____

_____

Vegetation phenology and natural history observations (include interesting avian encounters/observations; please record unusual bird sightings here and on the Rare Bird Report Form):

_____

_____

_____

_____

_____

Other:_____

_____

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS D-584, January 2009

National Park Service
U.S. Department of the Interior

Natural Resource Program Center
1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525

www.nature.nps.gov